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STEEL

The Magazine of Metalworking and Metalproducing

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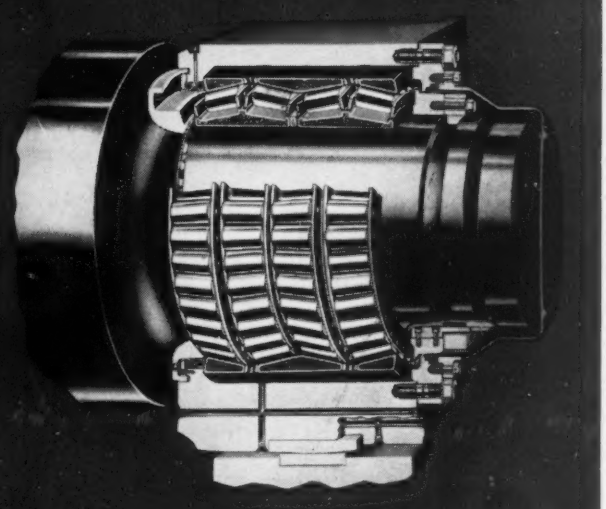

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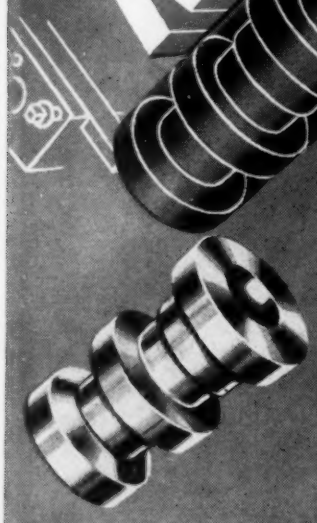

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Steel Drum Reconditioning on Specially-Designed Equipment

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STEEL

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August 1, 1949

Taxes, Wages, Profits

According to a news dispatch from Washington, research workers of the Tax Foundation have discovered that 116 separate federal and state taxes are paid on a man's ordinary tropical worsted suit before it is purchased by the wearer. The researchers did not attempt to count some other local taxes which were imposed along the way from raw material to completed sale.

Not long ago, an eminent automobile manufacturer, commenting upon the high selling prices of postwar passenger cars, declared it was practically impossible for builders to turn out a car to sell at $1000 or less because the taxes on the average current car total about $400.

These reminders of the important part played by taxes in the selling prices of commodities have a timely connection with the present debates on wages and profits. Wages and profits, as well as taxes, must come out of each dollar the consumer pays for goods. There is plenty of evidence to indicate that an overwhelming majority of the people have decided taxes should not go any higher at this time. This feeling is reflected by the attitude of Congress and in the belated decision of President Truman to withdraw his demand for $4 billion more in taxes.

If the public feels this way about taxes, it probably would take the same attitude toward wages and profits. In demanding higher wages at this unpropitious time, the unions are as unreasonable as was Mr. Truman when he asked for more taxes at the wrong time. Also they should be as willing to modify their demands to the realities of the situation as was Mr. Truman.

As for profits, the question of whether they were or are too high is rapidly becoming an academic one. Circumstances beyond the control of management are reducing earnings substantially. By the time annual reports for 1949 are issued, the charges of excessive profits will have died down to a mere whisper.

Thus the present issue boils down to the question of whether there is any justification for raising wages at a time when taxes should be going down and when profits and everything else that is not supported artificially are going down in response to natural economic corrective influences.

* * *

THE FORGOTTEN WORKER: Secretary of Labor Tobin has raised minimum wages for steelmakers on government contracts from a range of 45 to 62½ cents an hour to a range of $1.08½ to $1.23 per hour. He does this as administrator of the Walsh-Healey public contracts act in response to demands of the United Steelworkers.

This doubling of the minimum wage and, in fact, the basic idea of putting a floor under wages are justified by the government on the ground that such action prevents employers from taking undue advantage of employees. Undoubtedly such protection in many instances is necessary and desirable.

However, one wonders whether anyone ever gives any consideration to the plight of the tens of thousands of unfortunate workers who do not have the qualifications to hold a really good job but who are willing to work for whatever they are worth. Everytime the minimum wage goes up sharply, thousands of these marginal workers are priced out of their jobs and must go on relief. The result is particularly unfor-

(OVER)

tunate in a period when unemployment is above normal, as at present.

There should be some way of achieving the legitimate objectives of a minimum wage without harming the workers of limited abilities. Already the red tape of putting these men on a payroll militates against them. Greater ease in hiring casual and marginal workers would be beneficial to employer and employee and to the nation. —p. 50

* * *

BETTER COMMUNICATION: Improvements under way by the Bell Telephone System are significant on two counts. One is that the installation of various new devices recently developed will call for a substantial tonnage of ferrous and nonferrous metals. The second is that private enterprise, as exemplified by the Bell system, in contrast to the government-operated systems in many other countries, gives us a communication service that is far ahead of anything to be found elsewhere in the world.

Before long it will be possible for a person to dial a number in a distant city as readily as one now dials a local number. Also a marvelous mechanism will register calls on a punched paper tape, from which billing clerks can make the proper invoices. Additional improvements on the coaxial cable will open up new horizons of service on telephonic conversation and television. Another important development is the transistor, a simple electronic amplifier capable of performing many of the functions of the conventional vacuum tube. —p. 56

* * *

CLEANLINESS AN ASSET: In springless dial scales, the two pendulums which swing outward when load is applied are supported on shafts which turn in small ball bearings. Obviously, the lower the friction in the bearings, the more accurate will be the scales. Inasmuch as even the slightest particles of dust may cause some friction, it behooves manufacturers of sensitive scales to make doubly sure that foreign matter cannot get into these bearings.

In the scale department of Yale & Towne Mfg. Co. at Philadelphia this problem has been solved by taking extreme measures to insure cleanliness. Operations are in a room which receives filtered air and is kept under slight pressure so that any leakage of air is outward. The bearings are never touched by hand. They are cleaned, lubricated, tested and assembled by girls who wear nylon smocks and caps and perform these operations on stainless steel benches in glass booths.

An approach to these high standards of cleanliness probably would improve other products. It is a subject worthy of consideration by many manufacturers. —p. 78

* * *

NEWS MORE FAVORABLE: Considering the fact that we are in the dog days of summer, that numerous mass vacations are underway and that industry is in the throes of an economic adjustment, some of the current news is more cheerful than had been expected.

The firming of prices of nonferrous metals and the resumption of demand for them, which was noted several weeks ago, have been followed by a surprise upturn in the operating rate of steelworks. In addition a number of leading fabricators and manufacturers are recalling workers who were laid off earlier. In some instances, additional shifts have been inaugurated to catch up with suddenly revived demand.

Thus far these encouraging straws in the wind are not sufficient in number or in importance to establish a definite upward trend. Nevertheless they reflect at least a sporadic resistance to the steady downward drift of recent months. —p. 45

* * *

93 PER CENT ARE SMALL: Statistics on the automobile industry always are impressive. The latest figures show that there are 1871 companies manufacturing motor vehicles, parts and accessories; more than 43,000 passenger car and truck dealerships; 8000 automotive wholesalers; and 59,908 independent repair shops.

These businesses, together with truck operating, road building and allied activities, employ 9,020,000 persons. Indicative of the wide spread in size of the units comprising this gigantic industry is the surprising fact that 93 per cent of all concerns engaged in motor vehicle manufacture, distribution, repair and operation have less than 20 employees.

The manufacturing is done by large and small companies, but the distribution, repair and operation are handled chiefly by companies of small size. Motordom illustrates the complicated array of enterprises required to make, sell and service a major, mass-produced product. —p. 60

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

HOW'S BUSINESS?— Scattered signs of improvement are discerned by those looking on the brighter side. Steel mill operations have reversed a 13-week downtrend (p. 121), last week gained 4 points to 81 per cent of capacity. Demand for finished steel products is moderately improved as some consumers end mass vacations and others find inventories have been reduced below practical working level. Foundries report orders improving (p. 46). Four blast furnaces have been put back in operation (p. 45). The auto industry continues to surge toward new production records (p. 45) with one builder adding an extra shift and another going to a six-day week. A few instances of appliance and other metalworking companies rehiring furloughed employees and stepping up operations are noted.

EXPANSIONS— Three major steelworks expansions will get under way this summer (p. 62). Armco is building a new open-hearth plant at Middletown. National Tube will construct a welded steel pipe mill at McKeesport. Youngstown Sheet & Tube will enlarge its Campbell Works blooming mill to make possible rolling larger slabs and wider sheets for the auto industry.

LABOR— United Steelworkers decided to comply with the Taft-Hartley act by having its officers sign non-Communist affidavits (p. 50). Labor observers suspect the union may be planning some action against steel producers under National Labor Relations Board procedures should they fail to obtain a settlement of the wage dispute, now before a special fact-finding board. Meanwhile, the union has reduced its estimate of the cost of its pension and insurance program to less than half what the union last year said the program would cost . . . Minimum wages for steelworkers under the Walsh-Healey act have been raised to $1.23 an hour in the North and $1.08½ an hour in the South.

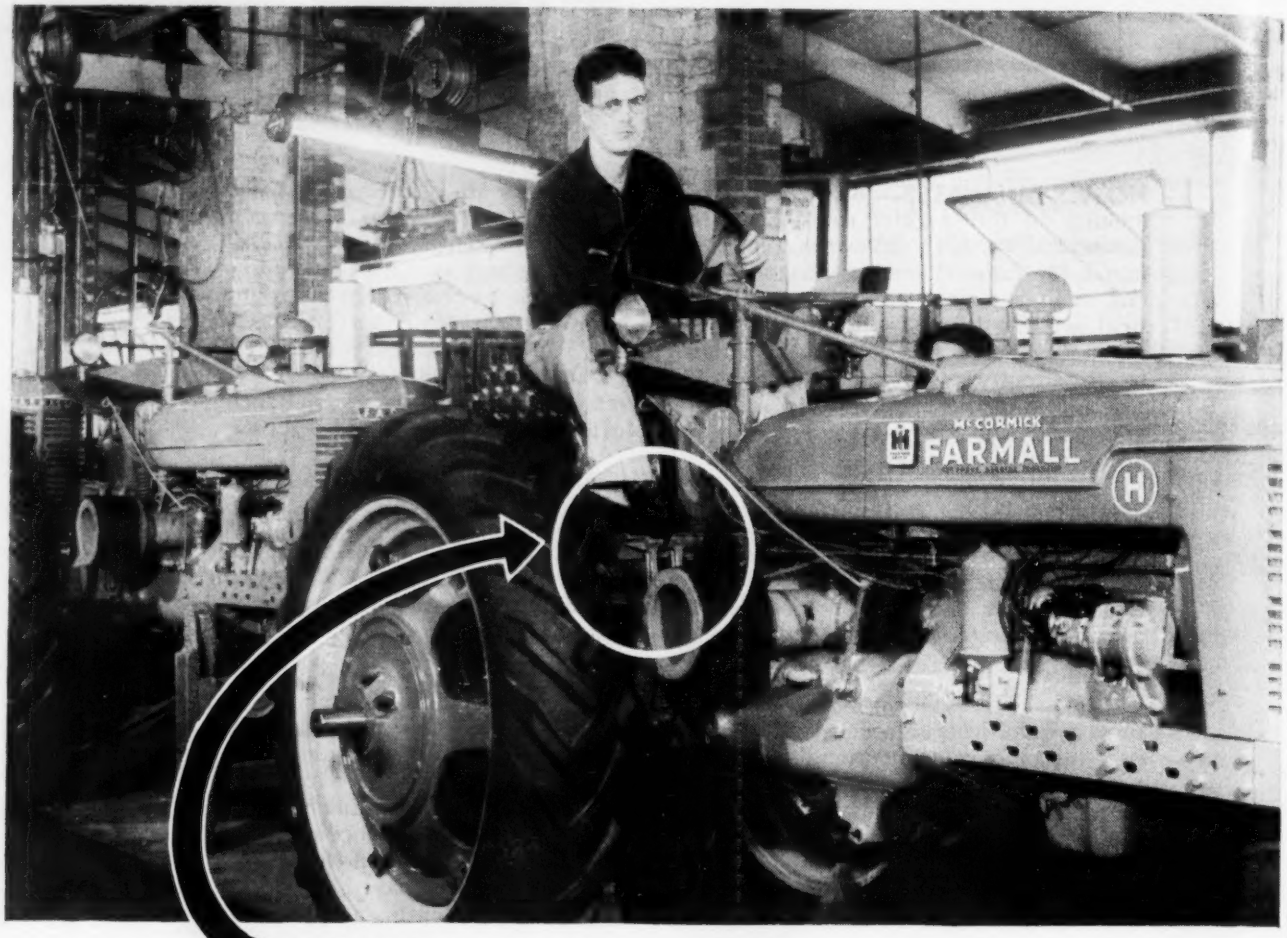
MILITARY AID— Don't expect too much in the way of business from the President's program for military aid to Europe. The total asked for the program is equivalent to two weeks of military production during the war (p. 47) and much of the material will be taken from present stocks.

COMMUNICATIONS MAGIC— New and spectacular developments by the communications industry are being dramatized for the public in a traveling exhibit organized by Bell Telephone System (p. 56). Featured are such things as long distance dialing, automatic message accounting, coaxial cables and transistors.

DIE-CAST AUTO DOORS— Kaiser-Frazer engineers have been experimenting with die-cast aluminum door frames, which permit a substantial weight reduction (p. 59). The development represents an interesting production development, although cost figures are uncertain.

RECOVERY IN EUROPE— A 30 per cent increase over prewar production is the goal set by the Economic Cooperation Administration for Marshall Plan countries by 1952 (p. 55). This would mean 58 million metric tons of steel, 500 million tons of coal, and similar increases in other commodities.

HERE AND THERE IN INDUSTRY— Second quarter steel mill earnings dropped from the first quarter, although first half figures exceed those for comparable 1948 period (p. 48) . . . Pontiac will build a new engineering building (p. 62) . . . First test run of a stainless steel conveyor belt for coal handling has been pronounced successful, may open a market for 2000 to 3000 tons of stainless annually, says Bituminous Coal Research Inc. . . . O'Mahoney freight absorption bill will be brought up for Senate action as soon as foreign aid appropriations debate ends . . . United States and Canada now have 5974 foundries, 19 less than in 1947; Ohio continues the leading foundry state (p. 51) . . . Half of all finished steel production is going to five consumer groups—automotive, construction, railroads, containers and machinery (p. 49).



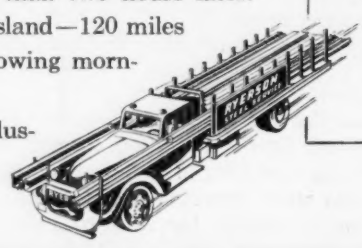
Quick Steel

Keeps Harvester Production Moving

At 3:15 P M. on April 11, International Harvester Company's Farmall Works at Rock Island, Illinois called the Ryerson Plant in Chicago. They wanted a thousand pounds of cold finished hexagons, 1⅜" x 10 to 12 feet. The bars were urgently needed for a brake pedal installed at an early stage of Farmall tractor assembly.

Marked "Rush" by the Ryerson service man who received it, the order was filled—the steel loaded and on its way at 5:05 P.M.—less than two hours later. Delivery was made in Rock Island—120 miles away at 9 A.M. sharp, the following morning.

This time-table graphically illustrates how fast and effectively Ryerson Steel Service swings into action when emergencies arise. With steel supply improving daily, our facilities for delivering all the steel you need exactly when you need it are better than ever. Just contact the nearest Ryerson plant for any steel requirement.



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Harbingers of Business Upturn?

Steel operations gain, after 13-week decline. Nonferrous demand continues to shove prices upward. Some metalworking companies add shifts, take on more workers

SCATTERED indications of improvement in business last week made encouraging hot-weather reading for metalworking executives.

Although the evidence is far from conclusive, the more optimistic observers see the current developments as harbingers of an autumn upturn. They believe the postwar adjustments in many lines are being completed and that the downtrend of recent months soon will be reversed.

Responsible for this cautious optimism are these developments:

Steel—Operations turn upwards after declining for 13 weeks. Mills last week worked at 81 per cent of capacity, a gain of 4 points. Some open hearths were put back in operation as result of increased orders. Pig iron demand also improved, raising blast furnace operations. Sales offices of steel producers report demand for finished products is better as metalworking companies complete mass vacations. Buying also is being stepped up by consumers who had allowed inventories to become depleted below practical working levels and by users who had held up buying in hope of a steel price adjustment in July or August. Any price adjustments now are expected to be delayed until final settlement of the steel wage question.

Nonferrous Metals—Zinc and copper prices continue to advance under impetus of consumer demand. Lead has rebounded 2½ cents a pound from its recent low to 14½ cents. Zinc is up 1 cent a pound to 10 cents.

Metalworking—A number of metalworking companies are stepping up operations. The auto industry continues to surge toward new records, with Chrysler going to a six-day week and Chevrolet adding a second shift on final assemblies. A bus builder has reopened its plant. Two appliance makers are adding extra shifts, and a third announces a schedule for increasing employment. An eastern fabricator has rehired two-thirds of workers furloughed earlier this year and expects to reach a postwar high in employment by Dec. 1. Farm equipment makers are more active in the steel market.

Expansions — Three major steel producers reveal plans for new mills and expansions to be started at once.

Nondurables—Soft goods felt the decline first and are completing their postwar adjustment first. Output of nondurables leveled off in May and June following a decline through the preceding five months. Many of these began to show improvement in June and July, particularly apparel wool and rayon textiles. New orders in nondurables are tending upward.

Apex Increases Production

SIZABLE increase in production schedules because of new orders is reported by C. G. Frantz, president of Apex Electrical Mfg. Co., Cleveland. The company will employ 1663 persons this month, an increase of 67 per cent over low point in May.

Mr. Frantz said inventories had been reduced from $6,027,620 at the first of the year to $3,779,627 June 30. Apex sales in second quarter totaled $4,077,207 compared to $3,615,510 in the first quarter and $9,692,608 in the second quarter of 1948. Sales in the first quarter were 13 per cent higher than those in the first quarter. He predicted continued progress in the third quarter of this year because in September the company will introduce a combination dishwasher and sink.

Full Operations at Crucible

NEW ORDERS have prompted Crucible Steel Co. of America to restore two open hearths to production and return to full operations at its Midland, Pa., works.

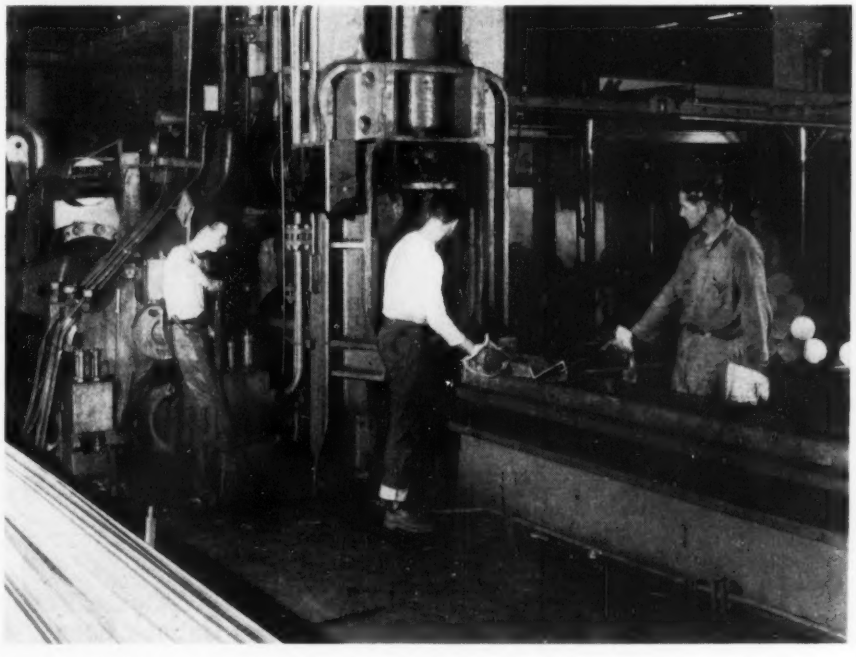
Allegheny Ludlum has added two open hearths at Brackenridge, Pa..

National Radiator Reopens Plant

NATIONAL Radiator Co., Johnstown, Pa., is reopening its Trenton, N. J., plant Aug. 1. Increased orders for cast iron radiators were responsible. Operations were suspended in April for lack of business.

Blast Furnaces Resume

SHARON STEEL CORP. has put two blast furnaces back in operation and Shenango Furnace Co. has placed one of its two stacks in blast. The



Production is running ahead of 1948 *at the Torrance, Calif., plant of Harvey Machine Co. Inc., maker of aluminum extruded and aluminum and brass screw machine products. Photo shows one of Harvey's large-capacity extrusion machines that can extrude any shape that will fit within a* 10-*inch circle*

Sharon stacks, one at Lowellville and one at Farrell, were taken off earlier in the summer and the company has been using cold iron since. Shenango supplies Shenango-Penn Mould Co. Bethlehem has added a stack at Buffalo.

Expanding Work Force

CONTINENTAL Copper & Steel Industries Inc., New York, producer of industrial equipment items, will expand its work force to reach a postwar high of 3000 by Dec. 1. About 600 of the 900 employees laid off in the first half of 1949 already have been rehired. The remaining 300 will be back at work by late September or early October. An additional 300 new employees will be hired between October and Dec. 1 as the company's $1 million plant expansion program goes into its final stages.

350 Rehired for Night Turn

ABOUT 350 employees will be rehired by Kelvinator Division, Nash-Kelvinator Corp., in adding a night turn on the final assembly line at the Grand Rapids, Mich., plant. Increased demand for the company's full-length door refrigerator made the added shift necessary. Kelvinator had reduced the working force at its Grand Rapids plant by 500 Apr. 18 and 700 on May 2 to meet the return to normal seasonal marketing conditions.

Chevrolet To Add Second Turn

CHEVROLET Division, General Motors Corp., will add a second shift to the company's Flint plant in about a week. General Manager T. H. Keating hopes the new shift will increase production 66 per cent at the plant. The action will make the Flint plant the third Chevrolet factory to add a night shift.

Production at the plant has been averaging 528 cars daily. With the two turns, Mr. Keating said, production will eventually go up to 848 cars. Chevrolet's plans are in line with other automakers who are seeking to meet the present peak buying surge.

Machine Tool Orders Index Falls

NEW ORDERS for machine tools dropped to a postwar low in June, reports National Machine Tool Builders' Association, Cleveland. Index for June was 53.8, a drop of almost 16 per cent from 63.7 in May.

The decline came in domestic business; foreign orders' index for May and June was 15.8. Since June shipments' index climbed to 79 to reach the high point for the year, the ratio of unfilled orders to shipments hit a postwar low of 3.5 to 1. Indexes are based on average monthly shipments; 1945-1947 equals 100. Annual shipments in the base period averaged about $353 million.

Gear Sales Index Down

AMERICAN GEAR Manufacturers Association, Pittsburgh, reports that its index of new orders placed for gears dropped to 227.8 in June, 8.9 per cent below May and at the second lowest point in the postwar period. The index is based on average monthly orders for the years 1935-1939.

Nation to Continue Readjustment

THE APPLIANCE industry has reached the bottom of its business decline, but the nation's economy at large probably will continue in readjustment until the second quarter of 1950, says James J. Nance, president of Hotpoint Inc., subsidiary of General Electric Co.

By then all industries should have completed their readjustments and become stabilized on a level greatly higher than that of the prewar period.

Aggressive selling is now needed by the electrical industry, Mr. Nance pointed out. Reductions have put electric appliance prices well within the proper levels of the nation's economy but it will take salesmanship to impress this on the public, he said. To do the selling job, the electrical industry must recruit 150,000 additional vigorous young men to go to homes and sell appliances. This, Mr. Nance explained, means an average increase of two salesmen for each of the 75,000 dealers handling electrical appliances.

Watching for Improvement

DEMAND for heavy equipment for industry is at the reduced level to which it has fallen in the last six months.

While some plants, such as steel mills, are making some improvements that can wait no longer, some sizable projects are being held up until managements can determine the business future.

One important producer of heavy industrial equipment says work forces have been trimmed largely to one shift of 40 hours a week.

GE Long-Term Outlook Good

LONG-TERM OUTLOOK for General Electric Co., Schenectady, N. Y., is favorable despite setbacks stemming from the present readjustment period. This assurance was conveyed to stockholders in a quarterly message by Charles E. Wilson, president.

The current business decline will not become serious unless aggravated and prolonged by factors such as an increase in wage levels, he said, adding that further curtailment of production and employment would be the inevitable result of increased labor costs. However, Mr. Wilson reiterated his earlier forecast that the present business decline may continue until about the second quarter of 1950, when he expects an upturn.

Although supply has caught up with demand in GE's lines of consumer goods, except television, the company still has a substantial backlog of orders for its lines of heavy apparatus.

Signs of Upturn Seen

SIGNS that reductions in materials inventories are being completed by durable goods manufacturers are noted by the foundry and merchant pig iron trade.

Jobbing foundries are experiencing a little pickup in orders for castings, and some have to order iron. However, the period of supply stringencies is past; new orders for castings and pig iron are confined strictly to current needs.

One seller reports demand for merchant pig iron in July was better than had been expected and that additional completions of inventory reduction will make August best of the last three months. Some of the pickup in July is attributed to an iron and steel industry strike threat that spurred foundries to lay in stocks of iron.

Another contribution to a pickup, says one seller, is the conclusion that there will be no immediate reduction in iron prices because of current labor negotiations. He thinks general feeling is that there is no advantage in holding inventories below a safe working level.

Twin Coach Reopens Plant

TWIN Coach Co., Kent, O., has reopened its bus plant to fill a backlog of orders totaling over $2 million. Production is expected to be up to three busses a day by the end of September.

Backlog plus orders being negotiated are expected to permit the company to maintain a substantial production schedule for the rest of the year. Early in July the company closed down its production line for the month because of falling orders.

The company has received an order from the Puerto Rico Transportation Authority for 40 busses.

Orders Would Not Surge from Arms Aid

Requested $1.5 billion for year's program is equivalent to only two weeks average production of munitions in U. S. during five years of defense preparations and war

WHAT does this mean to us? was the question in minds of metalworking company executives last week after President Truman asked Congress for $1,450,000,000 and broad new powers to arm western European nations threatened with Communist aggression and infiltration by Russia.

Amount sought is equivalent to two weeks' average production of munitions in the United States during five years of defense preparation and war. In that period—July 1, 1940, through July 31, 1945—munitions production totaled $186 billion, reports of the former War Production Board show.

The $1,450,000,00 sought by the administration is intended to carry the program one year, beginning July 1, 1949. However, deliveries of materials purchased with these funds are expected to be slow and spread over the current and following fiscal year.

Much To Be Taken from Stocks—State Department estimates that about 70 per cent of the value of military equipment delivered in the 1949-50 fiscal year will come from existing stocks and that 40 per cent of all equipment under the program would come from such stocks. Stocks not surplus would have to be replenished, but the replenishment would be spread over some time, says the department.

Furthermore, the department sees the program having only a small effect on demands for steel, copper and aluminum. Highest demand for steel plates, State Department officials say, would be 5.56 per cent of what they estimate to be capacity production from January, 1950, to July, 1951. Demand for carbon steel, they add, will be a little more than 0.33 per cent of capacity production. They put demand for copper and copper base alloys at a little less than 0.33 per cent of capacity output, and demand for aluminum products at 0.1 per cent of capacity production.

Arms shipments would exclude atomic bombs and secret weapons developed since the war. Bulk of the munitions shipments would be tanks, small arms, artillery, ammunition, trucks, radar and radio equipment, harbor defenses, antiaircraft defenses, planes and warships. The planes would be those designed to support ground forces, and not long-range bombers. The ships would be patrol craft and smaller vessels, not battleships or carriers.

Program's aim is said to be to equip or fill out equipment of ground, sea and air forces now organized in the European countries.

Of the $1,450,000,000 requested by the administration, $1,093,000,000 would go to Belgium, the Netherlands, Luxemburg, France, Britain, Norway, Denmark and Italy; $300 million would be set aside to arm Korea, the Philippines and Iran and to continue military aid to Greece and Turkey; $45 million would be held as an emergency fund; and $11 million reserved for administrative expenses.

Approximately $155 million of the aid for Europe would consist of machinery and other supplies for increasing armament production there, and the other $938 million would go for military equipment, delivery expenses and training assistance.

Grain Bins Purchased

PURCHASE of bins and comparable structures for grain storage by Commodity Credit Corp. to provide 50 million bushels of additional capacity has been announced by the Agriculture Department. Most of this storage will be placed in the Middle West and will not include any commercial type elevators.

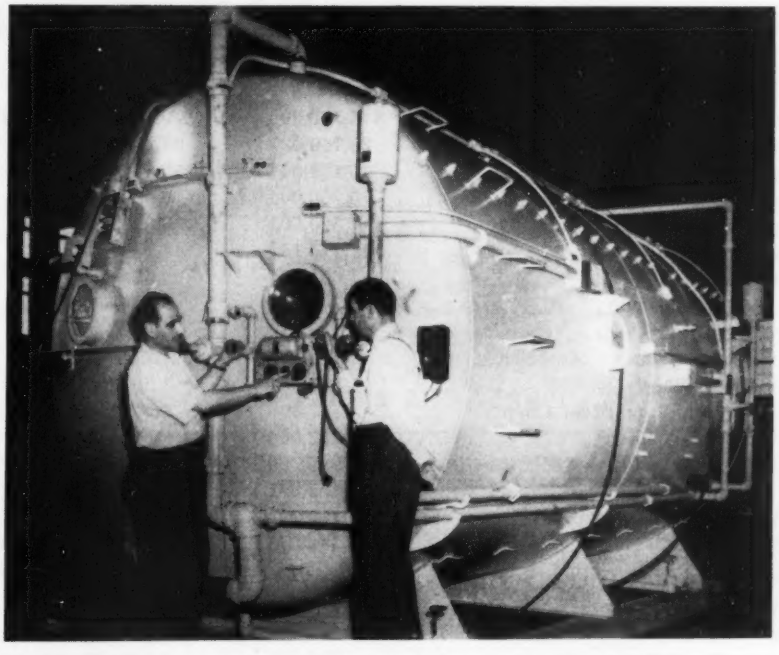
Sears Cuts Farm Machine Prices

SEARS, ROEBUCK & CO. has cut prices on farm implements 4 to 16 per cent in its retail division. Lower prices are also in effect in the company's fall and winter catalog now in the mail.

The company said raw material and manufacturing costs did not warrant the price cut, but that present economic situation makes it necessary to give farmers some relief if the sagging farm implement market is to be stimulated. A side delivery rake was cut from $320 to $295, a garden tractor from $185 to $169.50, and a corn planter from $120 to $105.

Gets Aircraft Subcontracts

SUBCONTRACTS totaling $6,651,000 have been received by Glenn L. Martin Co., Baltimore, from Grumman Aircraft Engineering Corp., Bethpage, N. Y. The contracts are for parts and assemblies for U.S. Navy Grumman planes, and work is being done at the Martin plant in Baltimore.



HIGH TEST: Stratospheric flight conditions up to 70,000 feet are simulated in this test chamber being examined by two Uruguayan Air Force officers. The chamber was built by Biggs Boiler Works Co., Akron, for the South American republic. The test unit is 22 feet long and 10 feet in diameter, made of ½-inch welded steel plate and weighs 30,000 pounds

Steel Earnings Decline

All but one of 16 ingot producers find second-quarter net income under that of first

EASING in demand for steel is reflected in second-quarter net earnings of steel producers.

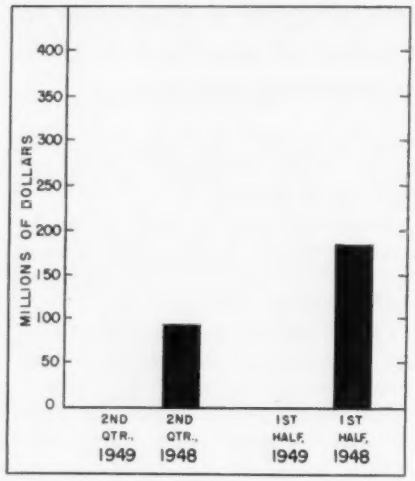
Sixteen companies which showed total net income of $163,146,786 in the first quarter of 1949 when steel ingot production in the nation averaged 101.5 per cent of capacity report a decline to an aggregate of $125,146,324 in the second quarter when ingot output was lowered to 91.2 per cent. Only one of the 16 companies had greater net earnings in the second quarter than in the first quarter.

However, the second-quarter earnings performance in 1949 was vastly better than that of the like period of 1948 when the total for the 16 producers was $88,963,752. Because both the first and second quarters of 1949 were accompanied by better earnings than the corresponding periods of 1948 the total net income of the 16 companies in the first half of 1949 was $288,293,110, compared with $183,529,405 in the first half of 1948.

In discussing its decline in second-quarter earnings, one company emphasized the sensitivity of steel industry earnings to volume of operations. Considering this sensitivity, the July operations of the steel industry do not promise an improvement in steel company earnings in the third quarter. United States Steel Corp., for instance, produced steel at an average rate of 99.8 per cent of capacity in the second quarter, but in the first 20 days of July its shipments were at a rate of only 70.3 per cent of finished steel capacity and new orders were continuing to decline.

NET EARNINGS

(16 Steel Producers)



Supervisory Training Described

PROPER training of supervisors can be a controlling factor in the progress of a firm, it is stressed repeatedly by executives who co-operated with Metropolitan Life Insurance Co., New York, in gathering case material on supervisory training. The material is published in a report "Supervisory Training: Case Studies," now available from the company.

Report provided executives interested in supervisory training with specific examples of how other companies train supervisors. Articles describe phases of various companies' experiences in supervisory training.

Subassembly Contracts Awarded

CONTRACTS for subassemblies have been awarded to Texas Engineering & Mfg. Co. Inc., Dallas, by Wichita Division, Boeing Airplane Co. and Consolidated Vultee Aircraft Corp. Beam channels about 8 feet long will be fabricated for Boeing's B-47 bomber. The Convair contract calls for machining various castings and forgings for the B-36.

Car Builder Closing Plants

PRESSED Steel Car Co. will shut down its McKees Rocks, Pa., plant for an indefinite period late in September. The plant has been partially closed for some time but several hundred employees have been retained. Company also is planning to close its Mt. Vernon, Ill., plant in mid-August. Reason: Lack of freight car orders.

Steel Producers' Net Earnings

	2nd Qtr. 1949	1st Qtr. 1949	2nd Qtr. 1948	1st Half 1949	1st Half 1948
United States Steel Corp.	$44,123,595	$49,928,670	$25,585,677	$94,052,265	$53,443,018
Bethlehem Steel Corp.	26,749,029	33,129,574	15,099,775	59,878,603	30,599,106
Republic Steel Corp.	10,178,544	15,298,627	7,805,410	25,477,171	16,938,390
Jones & Laughlin Steel Corp.	5,300,004	9,868,895	6,341,197	15,168,899	11,491,901
Youngstown Sheet & Tube Co.	7,520,705	10,022,660	5,609,764	17,543,365	12,033,330
National Steel Corp.	11,115,132	14,753,775	7,364,275	25,868,907	16,026,035
Inland Steel Co.	7,033,304	9,254,230	6,549,849	16,287,534	15,008,393
Armco Steel Corp.	7,703,772	8,404,861	6,157,055	16,108,633	12,024,402
Wheeling Steel Corp.	2,128,432	4,010,137	3,043,475	6,138,569	5,824,732
Crucible Steel Co. of America	239,750	1,714,315	633,757	1,954,065	1,201,543
Alan Wood Steel Co.	386,565	1,385,687	602,246	1,772,252	1,274,356
Allegheny Ludlum Steel Corp.	17,806	1,542,195	1,624,344	1,560,001	2,931,815
A. M. Byers Co.	283,900	564,800	555,700	848,700	1,080,900
Rotary Electric Steel Co.	299,700	1,022,052	680,059	1,321,752	1,098,353
Portsmouth Steel Corp.	1,855,367	2,043,222	904,915	3,898,589	1,933,460
Continental Steel Corp.	210,719	203,086	406,254	413,805	619,671
Totals	$125,146,324	$163,146,786	$88,963,752	$288,293,110	$183,529,405
FINISHING CAPACITY ONLY					
Acme Steel Co.	$1,111,680	$1,286,848	$1,477,533	$2,398,528	$3,442,000
Superior Steel Corp.	181,534*	104,645*	326,133	286,179*	551,850
Thomas Steel Co.	257,933	468,642	542,878	726,575	954,484
PIG IRON CAPACITY ONLY					
Sloss-Sheffield Steel & Iron Co.	$512,402	$875,340	$609,369	$1,387,742	$1,139,188
Interlake Iron Corp.	1,199,842	1,757,193	1,223,688	2,957,035	2,370,194

*Net loss.

Consume Half of Steel

Five largest consuming groups used about 50 per cent of steel in first four months

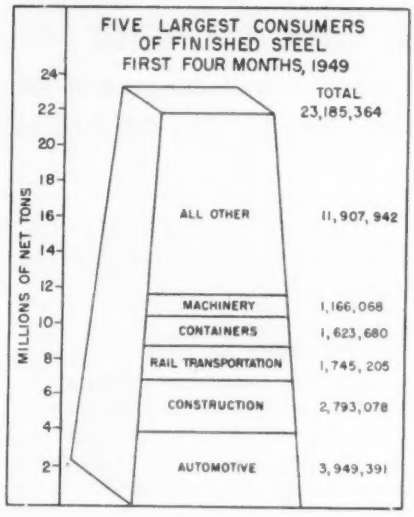
NEARLY HALF of all finished steel shipped by mills in the first four months of 1949 went to the five largest consuming groups.

Summary made by American Iron & Steel Institute, New York, shows that of the 23,185,364 net tons of finished steel shipped by mills in that period the five leading consuming classifications received 11,277,422 tons: Automotive 3,949,391; construction, including maintenance, 2,793,078; rail transportation, 1,745,205; containers, 1,623,680; and machinery, industrial equipment and tools, 1,166,068. Each figure except that of containers is an increase over the comparable 1948 figure. Total finished steel shipped by mills in the first four months of 1949 also exceeded that of the first four months of 1948 when the aggregate was 21,531,247 tons.

Several other consuming groups, less important tonnagewise, received largest increases in shipments percentagewise. Ordnance and other military got 36,975 net tons in the first four months of 1949, compared with 10,801 tons in the like period of 1948; shipbuilding and marine equipment received 335,652 tons, compared with 167,035; aircraft received 19,654 tons, compared with 12,002; and the oil and gas drilling classification was shipped 303,530 tons, compared with 225,875 tons.

Decreases recorded were: Domestic and commercial equipment other than appliances, utensils and cutlery, from 598,440 net tons in the first four months of 1948 to 524,901 tons in first four months of 1949; unclassified from 1,301,901 to 843,823 tons; exports from mills from 1,204,716 to 1,153,462 tons; and appliances, utensils and cutlery from 639,082 to 620,762 tons.

Shipments of finished steel to jobbers, dealers and distributors totaled 3,943,881 tons in the first four months of 1949, compared with 3,705,886 tons in first four months of last year.



Study Steel Technology Benefits

CO-OPERATING with the iron and steel industry, the Commerce Department is conducting a study to find how much finished steel production has been increased by technological improvements such as the use of oxygen in open-hearth furnaces. Investigation was prompted by the high steel yield in late 1948 and early 1949 when finished steel output was as high as 74.5 per cent of ingot production compared with a wartime yield of a fraction over 72 per cent. Another phase of the study concerns the possibility of increasing pig iron production from existing capacity by the use of high top pressures.

Scrap Committee Named

WILLIAM ROSENTHAL, Purdy Co., St. Louis, is chairman of the specifications committee of the Institute of Scrap Iron & Steel Inc., Washington, and Joseph S. Summer, Summer & Co., Columbus, O., is vice chairman. The committee determines the specifications for the various grades of scrap as to weight, dimensions, content, etc. Other committee members are: Walter I. Bregman, Price Iron & Steel Co., Chicago; Jack R. Forcheimer, Jack R. Forcheimer & Son, St. Louis; Frank I. Kilcline, Luntz Iron & Steel Co., Kokomo, Ind.; and Louis W. Landay, M. N. Landay Co., Pittsburgh.

$6 Million Plant to be Built

PRELIMINARY WORK is under way for a $6 million natural gasoline plant for the Dollar Hide pool of southwestern Andrews county, Texas.

The plant will be operated by Pure Oil Co. which will jointly own it with Magnolia Petroleum Co., Humble Oil & Refining Co., Union Oil Co., Lion Oil Co., Pacific Western Oil Corp., F. G. Blackwood, John W. Nichols and W. W. Whiteman Jr., of Oklahoma City, Okla.

The plant will have a capacity of 22 million cu ft daily, with compressor facilities scheduled for completion by Jan. 1 and the plant to be in operation by July 1, 1950.

Pig Iron Output Drops

BLAST furnace operations dropped 9 points in June to only 83 per cent of capacity, American Iron & Steel Institute reports. This is the lowest level recorded since April, 1948, when a coal miners' strike curtailed steel operations.

Combined production of pig iron, ferromanganese and spiegeleisen totaled 4,818,918 tons in June compared with 5,516,606 tons in May, bringing the total for the first six months to 32,641,691 tons compared with 28,961,544 tons in the like 1948 period. Production of pig iron alone, totaling 4,743,172 tons in June, by districts was: Pittsburgh-Youngstown district, 1,739,187 tons; Chicago, 1,052,447 tons; eastern, 947,014 tons; Cleveland-Detroit, 446,090 tons; southern, 387,888 tons; western, 170,546 tons.

PIG IRON AND FERROALLOY PRODUCTION FOR JUNE AND YEAR TO DATE

Blast Furnace Capacity and Production—Net Tons — June - 1949

	Number of companies	Annual blast furnace capacity	Production: Pig Iron		Ferro Manganese and Spiegel		Total		Percent of capacity	
			Current month	Year to date	Current Month	Year to date	Current month	Year to date	Current month	Year to date
DISTRIBUTION BY DISTRICTS:										
Eastern	12	13,353,580	947,014	6,270,604	30,880	179,993	977,894	6,450,597	89.0	97.4
Pittsburgh-Youngstown	17	26,625,920	1,739,187	12,215,460	25,284	132,699	1,764,471	12,348,159	80.5	93.5
Cleveland-Detroit	6	6,984,600	446,090	3,268,088	-	-	446,090	3,268,088	77.6	94.3
Chicago	7	15,655,390	1,052,447	6,810,402	12,978	17,258	1,065,425	6,827,660	82.7	87.9
Southern	9	5,010,060	387,888	2,447,255	6,604	41,735	394,492	2,488,990	95.7	100.1
Western	4	2,912,300	170,546	1,258,197	-	-	170,546	1,258,197	71.2	87.1
TOTAL	37	70,541,850	4,743,172	32,270,006	75,746	371,685	4,818,918	32,641,691	83.0	93.3

Union Reduces Pension Cost Estimate

Cuts last year's estimate by more than half, because of tax credits and "intangible" savings. Industry asks fact-finders to throw out pension claim

COST of pensions and social insurance is coming down—if one is to believe the United Steelworkers-CIO.

The union now estimates that the net cost of its $150-a-month pension plan and a generous insurance program would be 10.99 cents per man-hour to the steel industry. This figure includes 6.15 cents for pensions and 4.84 for insurance.

Last year the union figured the cost for these benefits would be about 23 cents an hour, including 13.5 cents for pensions and 9.65 cents for insurance.

Last year's figures were challenged by independent actuaries and insurance specialists who contended the cost of the social security program would be much higher than estimated by the union.

Case Before Fact-Finders—The revised cost figures are expected to be explored before the special fact-finding board appointed by President Truman to investigate the steel labor dispute. The board is now holding hearings in New York.

The downward revision in cost figures by the union is based on a study by Murray Latimer, former government analyst and now in the employ of the union. Mr. Latimer says the outlay necessary to support the $150 pension would amount to 12.81 cents an hour, but that the net cost would be only 6.15 cents because of "savings out of tax credits and nonreplacement of workers and factors that would reduce the overall figure." Outlay for insurance would come to 8.07 cents, but the net cost, says Mr. Latimer, would be 4.84 cents an hour "after allowing for the reduction in income taxes and other economies to the company which would be less tangible."

Asks Pensions Be Ruled Out—In the preliminary hearing before the fact-finding board, industry representatives argued that the union's pension demands should be excluded from consideration. Most of the steel labor agreements provide that contracts can be reopened this year only for negotiation on wages and social insurance.

The union argues that pensions are a form of wages and should be subject to negotiation.

The industry and the union will be allowed eight days each to present their cases to the board. The panel must make its report to the President by Aug. 30. The truce under which steel mills operations are continuing expires Sept. 14.

Steelworkers To Sign

UNITED STEELWORKERS-CIO will comply with the Taft-Hartley act by having its officers sign non-Communist affidavits. This will entitle the union to use the National Labor Relations Board procedures and facilities, which were denied as long as the union refused to comply with the law.

Union action arouses speculation as to what new strategy prompted this reversal in the steelworkers' stand. It is possible the union will attempt some action before the NLRB if no agreement with the steel industry is reached before mid-September. The union may file charges of failure to bargain with the board.

The steelworkers' union is not Communist-dominated, but until now has refused to sign the affidavits as a matter of principle.

MILK AND STEEL

MILK and steel are scarcely related, but the current wage controversy in steel last week was put forth as a reason for postponing a price advance on milk in the greater Pittsburgh area, scheduled for Sept. 1. In a hearing before the Pennsylvania State Milk Control Commission an attorney for the local milk dealers' association argued that the steel wage controversy had so upset the general economy the milk hearings should be postponed temporarily and the scheduled price increase put off until Oct. 1. By that time, it was reasoned, the steel dispute would be out of the way, and more settled economic conditions would permit sounder evaluation of the milk price situation. Commission denied the request for postponement.

Minimum Steel Wages Raised

MINIMUM wages for steelworkers employed by companies executing government contracts have been raised from a range of 45 to 62½ cents an hour, established 10 years ago, to a range of $1.08½ to $1.23 an hour. The lower rates apply to the South.

The action was taken by Labor Secretary Maurice Tobin, acting as administrator of the Walsh-Healey public contracts act, in response to demands of United Steelworkers at hearings last February. The union contended the old minimum wage level had been made obsolete by a succession of wage advances which brought the actual wage level up to the new minimums.

Steelmakers Demur — Steel company representatives objected to the union's request on the ground that the minimums asked were higher than those actually provided in current contracts. They said the union action was an attempt to force the general wage structure upward.

Present contracts between the union and the steel companies generally provide for a minimum wage, in northern areas, of $1.18½ cents an hour. This rate is paid to janitors, sweepers and other subminimum employees. Prevailing rate for steelmaking employees generally starts at $1.23 in northern mills.

Subminimum Rates Provided—Secretary Tobin's ruling provides that auxiliary workers or bona fide apprentices in skilled crafts may be employed at subminimum rates ranging from $1.04 per hour in the South to $1.18½ an hour in the North; these are the minimum rates usually specified in the contracts between the union and the companies.

Secretary Tobin estimates that fewer than 10,000 workers will receive pay increases as result of the amendment.

3-Day Week Attacked

BUSINESSMEN lined up in a solid front last week to attack John L. Lewis' decree of a three-day week in the coal fields.

George H. Love, president of Pittsburgh Consolidation Coal Co. called the abbreviated work-week "confiscation." Sen. A. Willis Robertson (Dem., Va.) termed it a move to dictate the coal industry's output and prices. Herman W. Steinkraus, president of the Chamber of Commerce of the United States, urged extension to labor unions of monopoly penalties of the antitrust law.

Irving S. Olds, chairman, United States Steel Corp., revealed the three-day week was costing his company money because higher-priced outside coal had to be bought to maintain

even the reduced operations of the company. Harry M. Moses, president of U. S. Steel's coal subsidiaries, said the United Mine Workers union has shown complete contempt of laws designed to curb the upsurge of economic power by unions.

Thurman Arnold, former New Deal trustbuster, and now in private law practice, urged Congress to bring labor unions under Federal antitrust laws.

A congressional drive against labor union monopolies was started with an investigation by the Senate Banking Committee. Senator Robertson directed the hearings.

The short work-week in the bituminous coal industry is making further inroads on lake shipping. Great Lakes shippers estimated that from 25 million to 30 million more tons of coal will be required for the territory before the close of the navigation season. They estimate shipments will have to average about 1.5 million tons weekly, or about 25 per cent of the three-day week production. The 1.5 million figure is based on the assumption that mines are turning out only 6 million tons a week now.

If the 6 million ton rate is kept up, the shippers see only 4 million to 4.5 million tons remaining for other areas during rest of the lake season.

Tin Plate Controls To End

EXPORT tin plate controls will terminate with the present quarter, the Tin Plate Industry Advisory Committee of the Office of Domestic Commerce was told last week. No tonnage directives for the fourth quarter will be handed out and there will be no formal priority program.

Industry representatives approved the action in view of indications that tin plate will be available in sufficient quantities to take care of foreign programs. Orders M 43 and M 81 are to be further modified or suspended in the near future. Office of International Trade had earlier removed quota restrictions on tin plate for fourth quarter export.

Tin will continue to be allocated until commercial relationships with foreign sources are re-established.

Stockpiling Speed Urged

COMPLETION of the national stockpile of strategic and critical materials should not be delayed, the Munitions Board told Congress last week as the Senate Appropriations Committee considered action on an amendment to cut $275 million from the $835 million previously appropriated for this purpose. Speeding up of stockpiling at the approach of a national emergency may not be possible even with unlimited funds, the board warns. At such time, industrial requirements might require release of materials from the stockpile instead of permitting additions to it.

Cost of the completed stockpile is now estimated at $3,217,000,000, a reduction from the January estimate of $3.7 billion because of lowered materials costs. Material on hand or under contract on June 30 made the stockpile 40 per cent complete. Commitments to be made in the current fiscal year will raise this figure to more than 60 per cent by June 30, 1950.

Unless funds are on hand to buy scarce items as they appear on the market, they are lost to the stockpile, the board said.

Foundries Total 5974

Latest compilation shows first decline in U. S. and Canadian plants since 1941

UNITED STATES and Canada now have 5974 foundries. This represents a loss of 19 in the past two years, according to *Penton's Foundry List*, 1949-50 edition, just published. Canada gained 29 units since 1947, while the United States lost 48. The latest compilation shows a reversal in uptrend for the first time since 1941. Decline is small, considering the low rate of foundry operations in the last 10 months. In the period 1941-1947 a gain of 760 foundries was recorded, following a decline which started in 1924 and carried through the depression years.

Since 1916 foundries have expanded greatly in size and their production has increased tremendously through the introduction of new machines and methods. The number of foundries in the latest listing, however, is only 316 below that of 33 years ago.

Ohio Leads—Leading foundry state is again Ohio with 585 castings shops, a gain of 14 from the previous compilation. Other leading states are: Pennsylvania, 546; Illinois, 452; California, 422; New York, 388; Michigan, 383; Indiana, 263; Massachusetts, 229; Wisconsin, 226; New Jersey, 204.

Ontario with 289 foundries leads the Canadian provinces and would rank seventh on a combined list of states and provinces.

Among the ferrous castings plants, gray iron foundries were most numerous totaling 3289 although they declined from 3448 in the previous listing. Steel foundries total 406, compared with 404 in 1947, and malleable foundries total 154, compared with 150 in 1947. Nonferrous foundries increased to 3576 from 3560 two years ago.

CALENDAR
OF MEETINGS

Aug. 10-12, Western Packaging Exposition: Civic Auditorium, San Francisco.

Aug. 15-17, Society of Automotive Engineers: National West Coast meeting, Portland, Oreg.

Aug. 23-26, American Institute of Electrical Engineers: Pacific general meeting, Fairmount Hotel, San Francisco. Headquarters are at 33 W. 39th St., New York 18.

Sept. 9-12, Instrument Society of America: Clinic on maintenance of industrial instruments, Hotel Statler, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 12-16, Instrument Society of America: National conference and exhibit, Municipal Auditorium, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 14-16, Porcelain Enamel Institute: 11th annual forum, Ohio State University, Columbus, O. Institute headquarters are at 1010 Vermont Ave. N.W., Washington.

Sept. 21-24, National Association of Foremen: 26th convention, Hotel Statler and Masonic Temple, Detroit. Association headquarters are at 321 W. First St., Dayton, O.

Sept. 25-Oct. 1, American Institute of Mining & Metallurgical Engineers: Midyear meeting, Neil House, Columbus, O. Details may be obtained from J. H. Melvin, Orton Hall, Ohio State University, Columbus, O.

Sept. 26-28, National Electronics Conference: 1949 conference and exhibit sponsored by Illinois Institute of Technology, Edgewater Beach Hotel, Chicago. Nathan Cohn, Room 1505, 307 N. Michigan Ave., Chicago, heads the exhibits committee.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Statler, Buffalo.

Oct. 3-4, National Association of Corrosion Engineers: South central regional meeting, Adolphus Hotel, Dallas. Heading the arrangements committee is G. R. Olson, United Gas Pipe Line Co., Shreveport, La.

Oct. 3-5, American Coke & Coal Chemicals Institute: Annual meeting, Skytop Lodge, Skytop, Pa. Institute headquarters are at 729 15th St., Washington.

Oct. 3-6, Association of Iron & Steel Engineers: Annual convention, William Penn Hotel, Pittsburgh. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Oct. 4-6, Society of Industrial Packaging & Materials Handling Engineers: Fourth annual exposition, Detroit.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, Drake Hotel, Chicago.

Oct. 10-14, American Society for Testing Materials: First Pacific area national meeting, Fairmount Hotel, San Francisco. National headquarters are at 1916 Race St., Philadelphia.

Oct. 12-15, Electrochemical Society: 96th convention, La Salle Hotel, Chicago. Details may be obtained from H. B. Linford, secretary of the society.

Oct. 13-15, Industrial Management Conference of the University of Missouri: Third annual meeting, University of Missouri, Columbia, Mo.

Oct. 14-15, American Institute of Mining & Metallurgical Engineers: Annual fall meeting, Southern Ohio Section of Open Hearth Committee, Deshler-Wallick Hotel, Columbus, O. Institute headquarters are at 29 W. 39th St., New York.

Oct. 14-16, Metal Treating Institute: 17th annual meeting, Cleveland.

Oct. 16-18, Conveyor Equipment Manufacturers Association: Annual meeting; write to G. D. O'Brien, assistant manager, Greenbrier Hotel, White Sulphur Springs, W. Va.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

New overtime amendment to Fair Labor Standards Act eliminates overtime-on-overtime payments. Government principal beneficiary of retroactive provision

MANY existing labor contracts may be rewritten and possibly some employers may have to pay less than they are paying for certain types of overtime work. Interpretation of the new overtime compensation amendment to the Fair Labor Standards Act by the Wage and Hour and Public Contracts Division, Labor Department, is slated for early publication in the *Federal Register* and calls for close study by employers.

Former interpretation, made public after the June, 1948, Supreme Court decision in the longshoremen's overtime cases, required calculation of total wages of men who had to work undesirable hours by the formula: Total earnings at straight time (sum of earnings at the contract rate in regular hours plus the earnings at premium rates for work during premium hours) divided by the number of hours. Resulting rate was to be paid for the first 40 hours, with time-and-a-half for work in excess of 40.

This rule applied in cases where: 1. Employment was sporadic as to hours or days worked, and 2. there was a definite agreement providing premium rates of pay for hours and days of sporadic employment without reference to the number of hours or days worked during the week. In cases where these two conditions were not present, employer was deemed to comply with statutory requirements when he paid premium rates as true overtime for work in excess of 40 hours.

Provision Clarified—Under the new amendment there apparently can be no quibbling. The statute says plainly that extra compensation resulting from a premium rate for work in sporadic times—nights, Saturdays, Sundays or holidays—as well as for work in premium or post-shift hours, "shall not be deemed part of the regular rate at which the employee is employed and may be credited toward any premium compensation due him under this section for overtime work."

Nobody knows how much money will be saved by employers through the retroactive provision which throws out pending "overtime-on-overtime" claims. Current estimates run all the way from $10 to $300 million. A principal beneficiary is the government which otherwise might have paid a lot of money to satisfy claims against cost-plus contractors.

Senate Version Passed — Senate version, incidentally, was finally approved and signed. House originally drafted the amendment for application exclusively in the longshore, stevedoring, building and construction industries. Senate later made it applicable to any employee regardless of the industry in which he is engaged and added the retroactivity feature.

Stockpiling Appropriation Cut

SENATE Appropriations Committee has approved a reduction of $275 million in the stockpiling item—cutting it back to $560 million in cash and contract authority for the procurement of critical and strategic materials in fiscal 1950. In addition, the committee wrote in a "buy American" amendment.

Sen. Elmer Thomas (Dem., Okla.) said in explaining the action: "The Munitions Board has been purchasing Canadian copper while domestic mines have been closing for lack of markets." The Canadian price was lower. Amendment does not bar foreign buying but charges the Munitions Board with buying in the U. S. where possible at reasonable prices. So, it is not at all definite.

This $275 million cut, along with the $1,118,000,000 slice in the total defense budget to $14,732,000,000, previously approved by the committee, is subject to Senate floor action as well as acceptance by the House.

Drum Decline Continues

ONE of the important business barometers, say some government economists, is the statistical position of heavy steel shipping barrels and drums because these barrels and drums are used so widely for many products, particularly those of the petroleum and chemical industries.

Latest figures, for April, tabulated by the Bureau of the Census, show the decline in demand for barrels and drums has not run its course. Here are the figures for the most popular item, the 55-gallon container made of 18-gage sheet steel: April shipments were 1,227,496 compared with 1,433,276 in March and with 1,692,691 in April of 1948; unfilled orders at end of April were 5,167,972, compared with 5,863,021 at end of March, and with 8,955,082 at end of April, 1948.

Housing Program Start Urged

STATE and local authorities were urged by President Truman to act speedily to put into effect the low-rent housing and slum clearance programs provided by the long debated housing bill which he signed July 15.

The legislation, the first major item of President Truman's "Fair Deal" program to be made effective, provides for construction in six years of 810,000 dwelling units at an estimated cost of $308 million annually over a period of 40 years. The slum clearance program calls for expenditure of $1.5 billion and a farm housing program will give direct loans of $250 million and grants of $75 million to farm borrowers.

Housing Administrator R. M. Foley hopes to get 50,000 publicly owned dwelling units under way within the first year.

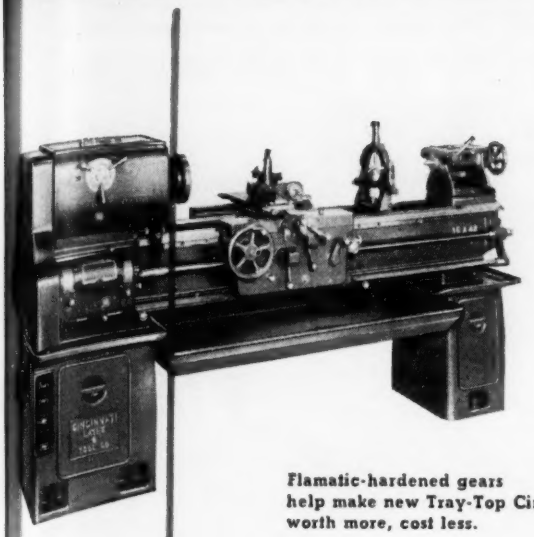
Housing Needs 4000 Workers

HOUSING Act of 1949 is the latest example of a steady stream of legislation in recent years which has been pushing federal employment upward. When the President requested an appropriation of $33,650,000 to administer it, he indicated that more than 4000 additional workers would be needed in 12 federal agencies. Most of them would go into units of the Housing and Home Finance Agency and Agriculture Department.

Clearinghouse for Small Business

CENTRAL clearinghouse to inform small business men seeking government contracts is proposed by Sen. Karl E. Mundt (Rep., S. Dak.). He says, "federal procurement has become so big that it is almost impossible for a small business man to know how to go about getting a contract."

Senator Mundt's recommendation is prompted by the suspension of Maj. Gen. Alden H. Waitt, chief of the Chemical Corps, and Maj. Gen. Herman Feldman, the quartermaster general, pending investigation of charges that they granted favors to so-called "5 per centers" who collect

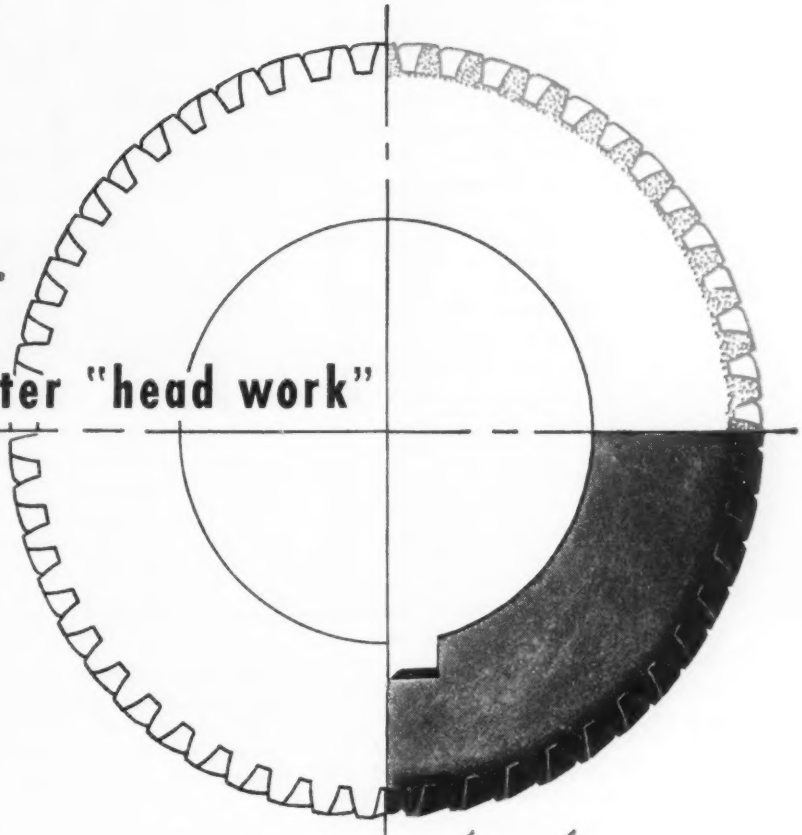


Flamatic-hardened gears help make new Tray-Top Cintilathe worth more, cost less.

gears hardened for better "head work"

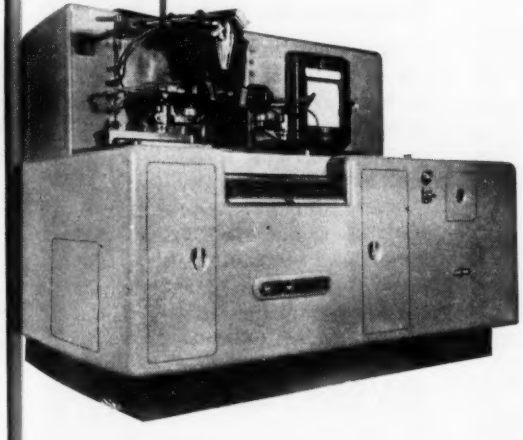
specified

Surface hardness, gradient, and depth held uniformly to predetermined values, as shown by etched section



achieved

Maximum service life, hard, long-wearing surfaces, tough cores, smooth operation and lowest processing cost in lathe transmission gears



More lathe for less money in every detail was written into the specifications of the Cincinnati Lathe & Tool Co.'s new economy-priced Tray-Top Cintilathe, a requirement that Flamatic-hardened transmission gears helped to achieve. First, the desired hardness patterns in the gears (for headstock, quick change gear box and apron) were literally **blueprinted** and optimum values for surface hardness were established. Flamatic proved that these specs could be held, right on the button, each gear—indeed each tooth—being **uniform** and **uniformly** good. Stock: SAE 3150; surface hardness: RC 52 to 58; production rate on 4" OD, 3¼" face, spindle helical gears: 180/hour.

Flamatic's exclusive electronic temperature control plus high temperature flames permit rapid heating of surfaces to within plus or minus 10°F. prior to oil quench. Gears up to 18" OD, shafts up to 24" long, cams, and similar parts are all within Flamatic's wide range of application. Investigate now Flamatic's ability to put **more value for less money** into your products. Write for booklet of case histories: Publication M-1658, or send us a part print for recommendations.

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THE CINCINNATI MILLING MACHINE CO.

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fees and commissions for aiding business men in getting government contracts.

Shifts in Government Posts

PHILIP M. Kaiser has been named as an assistant secretary of labor by President Truman. Formerly director of the International Labor Office, Mr. Kaiser will be one of three assistant secretaries and responsible for international labor affairs.

Dr. Francis E. McIntyre has resigned as assistant director of the Office of International Trade to become economic research director for California Texas Oil Co. Ltd. with headquarters in New York. He entered government service in 1942 with the Lend-Lease Administration, moved to the Foreign Economic Administration and finally joined OIT.

Albert F. Nufer, State Department, has been appointed U. S. representative on the Inter-American Economic and Social Council, succeeding Willard L. Thorp. Mr. Nufer has had many years of experience in economic affairs and has held important foreign service posts in American republics.

63 More Boards Abolished

ABOLITION of 63 more boards and committees in the National Military Establishment has been ordered by Defense Secretary Louis Johnson. This brings the discontinued committees and boards to a total of 133. Main reasons for the abolition orders were: The boards were no longer useful, they had completed their work or they were duplicating functions of other organizations. Two discontinued committees of the Munitions Board are of special interest to industry: The Engines, Turbines & Compressors Purchase Assignment Committee and the Interservice Munitions Board Committee on Standardization of Internal Combustion Engines.

Prices to Armed Forces Cut

DEFENSE officials disclosed a short time ago that almost every item bought by the armed forces with the exception of automotive gasoline has shown a price decline in the last six months. The 7 per cent rise in motor gasoline, however, more than offset a 37 per cent drop in fuel for the Navy's ships and a 6 per cent decline in aviation gasoline.

Garrison rations costs have dropped 6.2 per cent since January; clothing is 8.39 per cent less than for fiscal 1948; general supplies, including office supplies and equipment, sanitary and kitchen supplies, are down 8 per cent; construction materials, around 5 per cent; certain automotive vehicles are down, but the overall picture is largely unchanged.

WORK AND PLAY: Working hard on unification of the armed forces, the country's high command also takes time out to play together. Shown here at White Sulphur Springs, W. Va., in a conference on effective harmonization of the services are, left to right: Gen. Hoyt Vandenberg, Air Force chief; Steve Early, undersecretary of defense; Adm. Louis Denfield of the Navy; and Defense Secretary Louis Johnson. A few hours later the four were competing on the horseshoe courts. NEA photo

NME Clarifies Record Storage

LENGTH of time records of completed or terminated military contracts must be retained has been clarified by National Military Establishment to reduce contractors' storage costs. Munitions Board states that under certain circumstances records may be replaced with acceptable microphotographs or contractors may apply for permission to destroy them.

Decisions about length of time records must be preserved are obtainable from the contracting government agency.

REA Loans Total $2.2 Million

RURAL Electrification Administration approved loans totaling approximately $2.2 million to nine borrowers in seven states during the week of July 11-15. Funds will be used for 710 miles of new distribution lines and system improvements which include: 18 miles of new tie and 6.5 miles of new transmission lines, headquarters facilities, two-way radio communication systems and completion of previously approved construction.

FTC Grants Delay in Steel Action

FURTHER postponement has been granted by the Federal Trade Commission in the action against pricing in the steel industry. An additional month is being allowed for preparation of briefs on respondents' motion to dismiss the case. The briefs now are due Aug. 25.

Broadcasts on Current Business

COMMERCE Department is presenting a series of five special programs on the current business situation in co-operation with the National Broadcasting Co. The broadcasts will be produced weekly on the University of Chicago Round Table program, Secretary of Commerce Charles Sawyer announced. Outstanding business leaders, Commerce officials and members of the faculty of the University of Chicago will participate.

ECA Sales Published

BY HAVING the Census Bureau do its tabulating work, the Economic Cooperation Administration now is able to publish after a lapse of two months the names of United States companies booking orders under the Marshall Plan, together with the character of the goods sold, the dollar value and the country of destination.

European Goals for 1952 Set by ECA

Steel, pace-setter in 1948 among heavy industries, has 1952 goal of over 58 million metric tons. British output for first half of 1949 highest ever achieved

GOAL for industrial production in 1952 for all countries participating in the European Recovery Program has been set at 30 per cent above prewar by the Economic Cooperation Administration. By 1948 production virtually equaled prewar levels, and in the last quarter of that year was 5 per cent above prewar.

Steel, pace-setter in 1948 among heavy industries, has a 1952 goal of over 58 million metric tons. Output last year was 40 million metric tons, a 30 per cent increase over 1947.

Improvement in the European fuel situation is shown in reduction of U. S. coal exports to participating countries from 33 million metric tons in 1947 to an estimated 14 million metric tons in the 1949 fiscal year. Goal for western European coal production in 1952 is over 500 million tons, more than 100 million tons over output in 1948.

What are the European nations doing to reach these goals?

British steel output for the first half of 1949 was the highest ever achieved. Bizonia's steel outturn in the first year of the Marshall Plan was more than 1.6 million tons over the 6 million tons set up as a target. By the end of June of this year a continued upward trend in production was indicated by daily records. In France recently established peaks have again been surpassed.

United Kingdom

TOTAL production of steel ingots and castings in Great Britain in the first six months of 1949 reached 7,949,000 tons, 384,000 tons greater than the first half of 1948, the previous best. Even when allowance is made for the seasonal slump in output in the vacation months, July and August, there is good reason to hope the high official target for 1949 will be reached. However, prospects are not as bright as they were at the beginning of 1949. June production was set at an annual rate of 15,645,000 tons, the highest rate ever achieved in the month and particularly encouraging since the Whitsuntide holiday interrupted production this year. Pig iron output in June was at an annual rate of 9,644,000 tons against May's 9.7 million tons. Drop in pig iron production was in part caused by the shutting down of several furnaces for relining, by a heat wave and by the prolonged drouth.

Rolling stock builders are active, hence there is heavy demand for steel rails, plates, points and crossings. Structural steel is wanted for construction that will require steel for the next two years. Shipbuilding activity is responsible for much of the business of tube mills where orders extend over many months. Steelworks are still able to absorb all available scrap.

Total exports from the beginning of the year continue at a higher level than a year ago, totaling 89,368 tons compared with 87,755 tons.

Bizonia

BIZONIA'S steel ingot production reached 750,264 metric tons in June compared with 770,788 tons in May, but there were 25 working days in June against 25½ days in May. Production targets were exceeded by 6.1 per cent for steel and by 5.6 per cent for pig iron. The ten leading steel plants of the Ruhr showed new records of daily output toward the end of June.

Germans are raising certain points regarding active French and Belgian steel groups to re-establish the European steel cartel: 1. No central body of Ruhr steel industry exists which could serve as a formal partner of a European cartel. 2. Antitrust and anticartel laws of the allies in Germany still prevent revival of a German cartel. 3. Dismantlings have distorted German capacities in plates and sheets which can no longer be filled by Germans. 4. Germans do not expect Britain to join such a cartel while socialization of British steel hangs fire.

France

PRODUCTION of electric power, steel, cement and oil refining in France has surpassed recently established records. There is some overproduction, and France must now find outlets abroad. Steelmakers are exporting as much as they were before the war. Exports of automobiles exceed the numbers that the industry built in 1947. Coal production in May was at the April level.

Although heavy industries reached a new record, greatest progress has been realized in the automobile industry. Since the period of prosperity in 1939, production of automobiles in France had not reached the same high level until last May. Number of private cars manufactured in May corresponds to 111 per cent of production level in 1938 and commercial vehicles to 255 per cent. Export of French autos has made progress since the war. About 77 per cent of private cars and 34 per cent of commercial vehicles exported in May were sent to foreign countries and the balance to French territories.

In the first quarter of 1949 France exported 24,504 motor vehicles, of which 13,615 went to foreign countries and 10,889 to territories.

Belgium and Luxemburg

STEEL production in Belgium and Luxemburg has been dropping since April when a peak level was reached. In May output dropped to 341,440 tons from April's alltime record of 416,000 tons. A further decline was registered in June at 322,520 tons. Pig iron production has diminished, too; some blast furnaces have been damped or blown out. Another unfavorable trend is noted in the gradual accumulation of stocks of coal and coke. Imports from Germany have been cut and are likely to be reduced further.

Indirect exports of machinery and steel products, although less adversely affected, are becoming more difficult; volume of orders booked at present is smaller than actual shipments within or out of the two countries. Machine tool, textile machinery and agricultural implement manufacturers are receiving fewer and fewer orders.

Austria

ALTHOUGH its foreign trade has increased steadily since 1946, Austria has been unable to keep pace with most other European countries in postwar commercial recovery. Reestablishment of Austrian foreign trade to date has not resulted in any significant new trends insofar as major categories of commodities are concerned, but exports of pig and scrap iron and finished steel and iron products have increased remarkably since 1937.

Italy

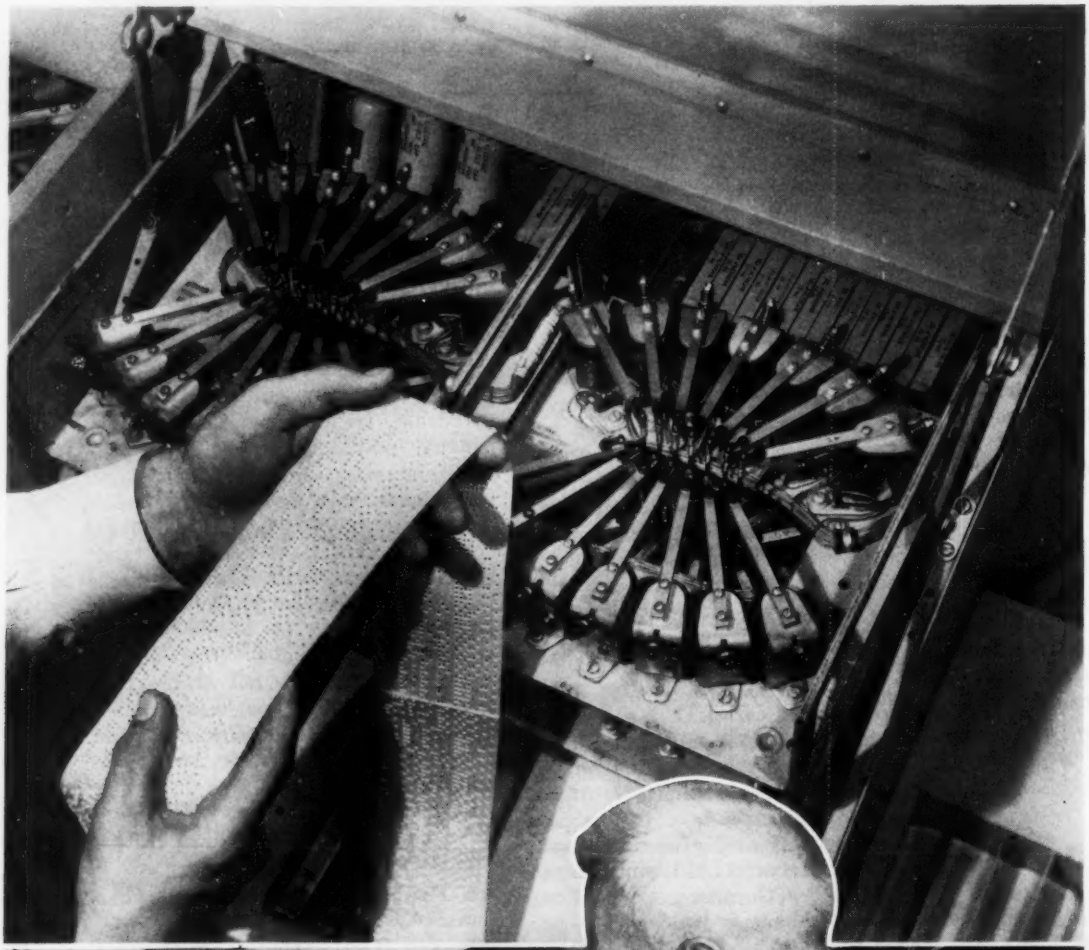
INDUSTRIAL recovery project to provide a pipe forming and welding machine for Ferrotubi, subsidiary of Fabrica Italiani Tuba, Milan, Italy, and another project for rehabilitating lubricating oil manufacturing at a refinery near Trieste have been approved by ECA.

Telephone Developments Open New Vistas; Ex

NEW vistas in communications equipment which may be realized in the near term point to speedier and more efficient service for business and industry. They also chart the need for a vast quantity of steel and nonferrous metals for construction and expansion purposes. To dramatize these advances, the Bell Telephone System has organized a special traveling exhibit, now touring metropolitan areas and state capitals.

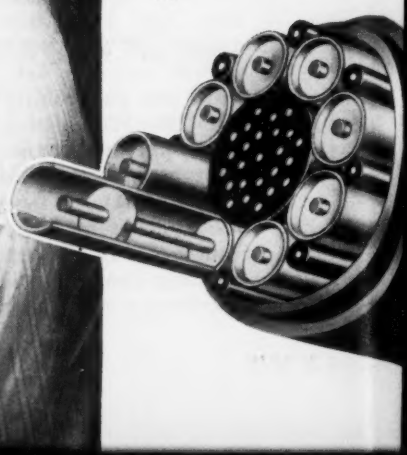
Featured prominently are such new developments as operator toll dialing for long distance service, enabling operators to dial calls through to distant points without assistance of other operators along the route or at the destination; customer toll dialing hooked up with automatic message accounting (AMA); radio relay systems for carrying "bundles" of telephone conversations, as well as television programs; and various new tools in the communications field like synthetic crystals, miniature amplifiers—of which the transistor is the most spectacular, and improved coaxial cables.

Direct Dialing — Under operator



Intricate tape-punching equipment, heart of a new automatic message accounting system. Paper tape, on which records of thousands of calls are carried, contains information on the calling and called numbers, the month, day and exact time to tenths of minutes at which conversations begin and end

Other part of the automatic message accounting system is this "reader" which is able to scan 80 coded digits per second. The machine not only translates the perforations but also sorts, summarizes and prints so that telephone bills may be made from it



Expand Market for Metals

toll dialing, direct dialing of telephone numbers in New York, Philadelphia and Chicago or 300 other cities connected to these main switch points is possible at a considerable saving in time. Brains of the system are automatic relays, oscillators and a mass of other equipment, both at the main switch points and at all connecting points. To accommodate the plan, it was necessary to divide the U. S. and Canada into 83 "toll areas," grouped roughly according to population and each having its own three-digit code number.

How It Works—Say a Detroit operator wants to put a call through to Worcester, Mass., 3-6842. She plugs into a direct-connecting circuit to the New York switch, then dials 201, the Worcester code, and finally 3-6-8-4-2. Actually the operator does not dial but rather actuates pushbuttons on a small ten-button panel desk. These buttons, through special types of oscillators, transmit the required impulses over the long-lines circuit.

Toll dialing equipment was installed in Cleveland in June, will go into Oakland, Calif., in August and into Boston in October. It will probably be another ten years before it can be extended to all long-distance customers in the country. Western Electric Co., the manufacturing subsidiary of A. T. & T., is behind schedule trying to keep up with demand for these advanced types of equipment.

Automatic Accounting — Perhaps even more complicated is the automatic message accounting equipment, developed as an offshoot of the teletypewriter principle.

AMA works like this: When a subscriber lifts his receiver, the dial switching equipment "finds" the line and at the same time connects itself to an idle AMA unit. This, briefly, is a machine with groups of metal fingers punching small holes in a 3-inch tape in certain code patterns, plus a decoding unit which translates the punches into printed billing information. The AMA perforator records the number of the subscriber making the call, the called number, the date, the time the call starts, whether the call is being made from a "flat rate" or "message rate" instrument, whether or not the called party answered and, finally the time the call is completed. It can handle hundreds of such calls.

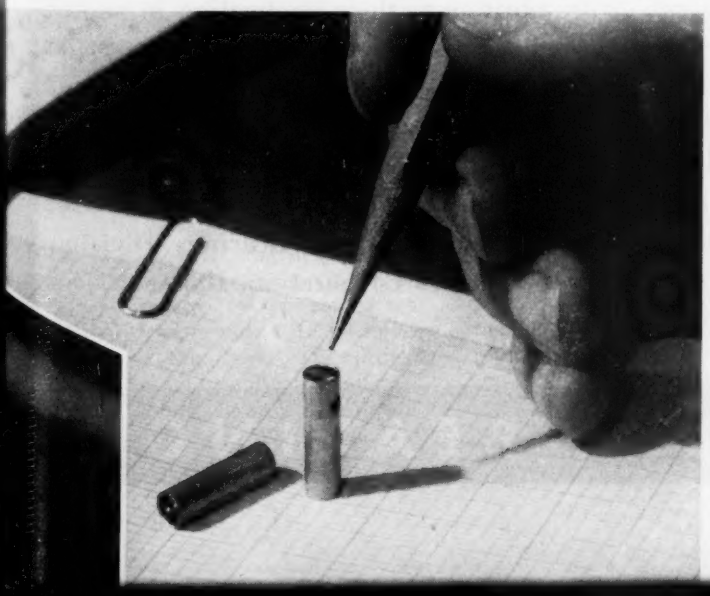
Coaxial Cables—"Super highways for voice and vision" is how the Bell System describes its steadily expanding network of coaxial cable and microwave radio relay towers for carrying "bundles" of telephone conversations or several television signals between distant points. Rapid growth of television has spurred this development tremendously. There are now better than 3500 miles of intercity television network channels in operation and this distance will be tripled in the next two years when 21 more cities will be added to the present 13 now linked.

Coaxial cable consists of a group of eight "coaxials"—each a copper wire suspended inside a copper tube; a central core and the interstices filled with from 12 to 120 pairs of insulated wires. The entire grouping is covered with insulation and a lead sheath. The insulated pairs of wires are used for control and alarm circuits and short-haul toll circuits. Their requirements vary from place to place, so a wide variety of combinations is manufactured. Cost of manufacture and installation are high, but capabilities are amazing. In a new design, a single pair of "coaxials" will provide either 1800 telephone conversations or 600 conversations and two television channels simultaneously.

Transistor—One of the most interesting developments which has come out of the Bell Laboratories is the transistor, a simple electronic amplifier no larger in diameter than a pencil, about 1 inch long and capable of performing many of the functions of the conventional vacuum tube used so widely in radio and telephony. Basically it is nothing more than a sealed metal tube in which two fine copper wires are positioned to be in contact with a "spot" of germanium metal no larger than the head of a pin. When simple battery power is applied, the germanium metal has the property of "valving" the power proportionately to a weak incoming high-frequency signal, thereby amplifying it hundreds of times and passing it on. The transistor is barely out of the laboratory stage, but Bell technicians see a great future for it.

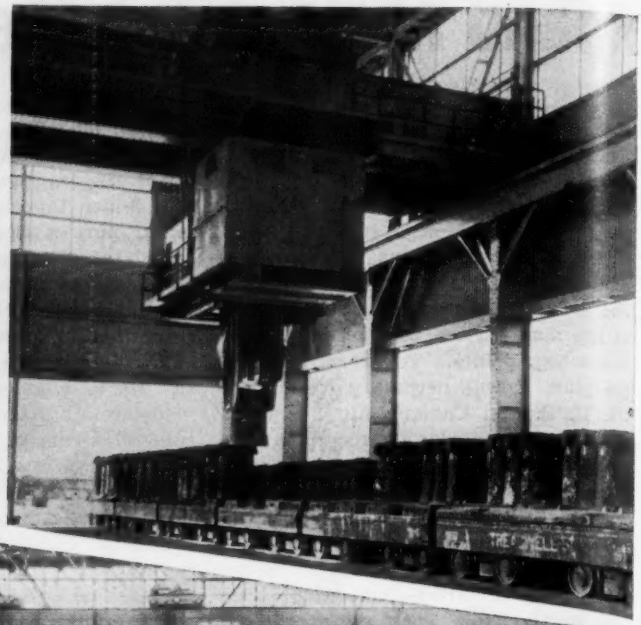
Progressive Process — Engineers emphasize that these and other innovations in the communications field do not come into being overnight and find immediate application. It is a slow, progressive process of experiment and test, then "grafting-in" the new ideas little by little as modernization and expansion proceed and as the system spreads. Ten years is just a flick of the eye in perfecting and applying on a broad scale the new techniques evolved by telephone engineers.

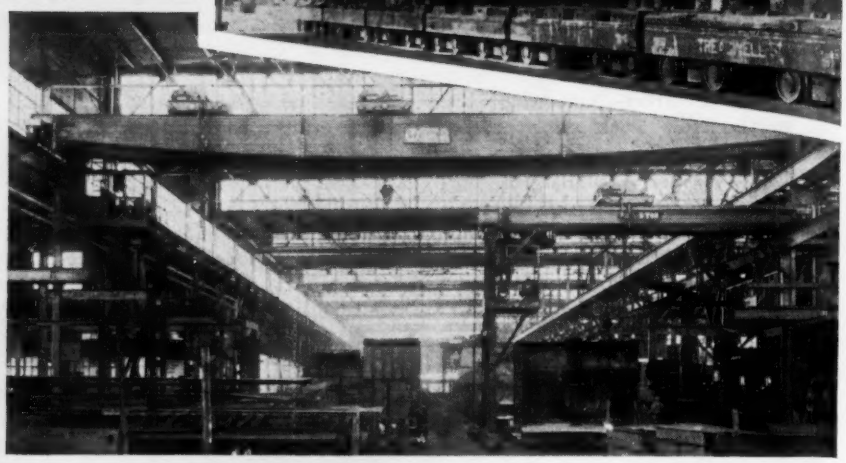
The telephone is 73 years old. There are now approximately 31,364,000 in service, compared with only 8,134,000 in 1920. Average daily conversations have mounted to better than 125,000,000. Investment in telephone plant equipment runs to $8619 million, better than six times the total of 1920. Employment exceeds 547,000—well over twice the number at work following the first World War.

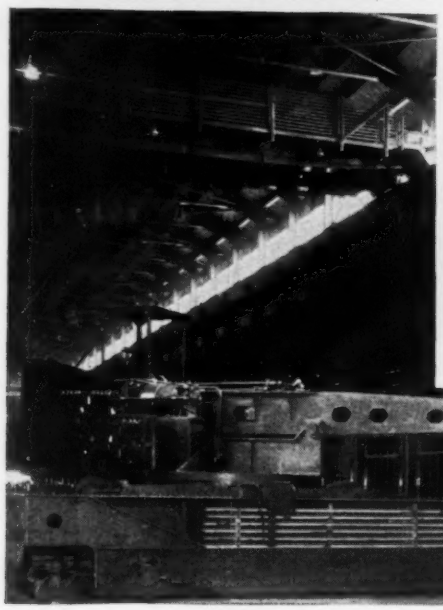


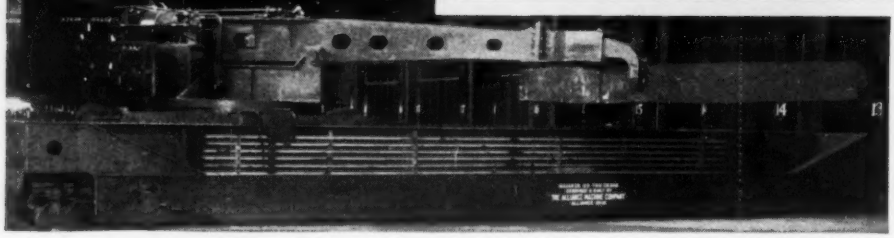
An "eight coaxial" cable, shown in center, is capable of carrying 1800 simultaneous telephone conversations

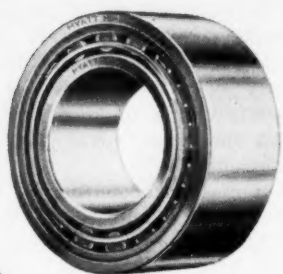
One of the latest wonders in the field of electronics is the transistor, shown at left, which performs nearly all the functions of an ordinary vacuum tube, serving either as amplifier or oscillator. It has been shown to produce amplification as high as 100 to 1, and some test models have been operated as amplifiers at frequencies up to 10 million cycles per second











In Steel Mill Cranes...It's HYATT

Yes, Hyatt Roller Bearings predominate in all types of electric over-head traveling cranes and open hearth charging machines.

With Hyatt Roller Bearings at all turning points in the bridge and trolley, in motors and sheaves, smoother, quieter operation with reduced power and maintenance is the result. Hyatts provide easy rolling for accurate spotting, shafts are kept in alignment with wear eliminated and the fraying of cables is minimized by free turning sheaves.

In addition to their application in cranes, Hyatt Roller Bearings also have a long record of successful operation in cars, tables and other auxiliary equipment. That's why Hyatt Roller Bearings are so consistently specified for new equipment and so extensively used for changeovers. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Die-cast aluminum door frames by Kaiser-Frazer represent spectacular production achievement, although economics of application are questionable. Other uses studied

DETROIT

DIE-CAST aluminum door frames, which Kaiser-Frazer engineers have been experimenting with for the past couple of years, represent a spectacular achievement from a production standpoint but the economics of such application are questionable. The casting, a complete inner door frame, measures 33 x 43⅜ inches and weighs 13⅜ pounds before trimming. This permits a claimed reduction of 8.6 pounds per door and does away with four steel stampings per door. However, there would be little if any reduction in cost and in view of the exceptionally high cost of the large die with its numerous ejector pins and the many hand-set cores, the aluminum casting might cost considerably more than the present steel design, unless production were exceptionally high.

The door castings can be produced at a rate of 30 per hour, and thus four units would have to be operated two shifts to supply doors for 500 four-door sedans daily. K-F researchers think they can discern a number of possible advantages in the cast doors such as lighter hinges, more exact fitting of hardware, better weather sealing, easier accessibility for repairs and use of a door pillar with less reinforcement, but they emphasize there are no plans for putting the units into production.

In assembly, the regular outer door panel of formed steel is fitted over the die-cast inner door so it is still necessary to have the conventional dies and presslines to produce the outer "skin," and some means must be worked out for making a tight joint between the die casting and the steel stamping. This has been one of the tougher problems encountered.

Other Applications Studied—Meanwhile, other parts are being studied for possible die-casting applications. They include inner frames for instrument panels and rear deck lids. It will be recalled some years ago Ford launched a program for production of rear deck lids of molded plastic laminate. A number of test cars were equipped with the lids and put in the field. The project was ultimately dropped, because of the high production costs involved.

Kaiser-Frazer is now shipping its Vagabond utility model, a higher-priced ($2288) version of the Kaiser Traveler and powered by 112-horsepower engine. Two large hinged panels open up at the rear to provide access to cargo space of 130 cu ft. The lower panel folds down to form a tailgate level with the cargo floor and the upper panel which includes the rear window hinges from the roof and opens upward. The car may be driven with the panels opened if the space is loaded to capacity.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	605,000*	489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

*Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
July 9	118,611	98,700
July 16	156,436	120,741
July 23	156,100	118,797
July 30	152,000	113,270

Estimates by Ward's Automotive Reports

Chrysler Works Saturdays

CHRYSLER has stepped up its weekly assembly rate by instituting Saturday work in all divisions, although officials were keeping their fingers crossed on reception of the plan by union workmen. There is much sentiment among working forces against the 9-hour day or the six-day week, even though it does mean appreciably higher earnings. In one case a plant had to cut back a projected 9-hour day to 8½ hours simply because work crews could not be persuaded to put in the extra hour. Chrysler schedules in all divisions are geared to a pace of 6400 cars and trucks per day, this being the peak level. The only way to build better than 32,000 units weekly is to work more hours and in the face of continuing torrid demand from the field for automobiles schedules are being stretched to meet it.

Contract Talks Stalled

CONTRACT talks between the UAW and Chrysler covering economic issues are completely stalled presumably until some sort of pattern is established in the new Ford contract. However, the latter negotiations too remain on dead center and likely will stay that way until a settlement is reached in the steel industry on union demands. So it appears that there is small chance of any interruptions this summer in automobile production other than the usual flare-ups which keep breaking out here and there to force occasional brief assembly line tieups.

Many Enter Design Contest

JUDGING of model automobile entries in the annual Fisher Body Craftsman's Guild competition is drawing to a close, with the largest field on record, better than 15 per cent ahead of last year. The miniature cars have been on display at the General Motors building, drawing wide attention from both the public and auto company personnel. Many reflect considerable ingenuity in design and styling, although there are few which are productive of ideas which might be translated into actual automobiles.

Cash awards and university scholarships aggregating $65,000 are at stake in the competition, the eleventh since inception of the guild in 1930 as an organization devoted to the development of craftsmanship and creative ability among boys. There are junior and senior divisions, the former a 12-15-year age group, the latter a 16-19-year group.

Models, usually built of wood or plaster and of solid construction, observe certain practical limitations in design such as sufficient head and leg room and maximum limits of front and rear bumper overhang. Each is designed for five passengers, and is approximately 16 inches long. Points

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on which the miniature cars are scored are divided among scale fidelity, workmanship, painting, originality of design, artistic merit of design and practicability. Either front or rear-engine designs are acceptable. In this respect it was noted that last year almost one out of every three entries was a rear-engine type, while the proportion this year is not as high.

From the thousand or more entries state and regional winners are selected, the latter being selected from the first-place winners in the states. Forty regional winners are brought to Detroit Aug. 24-27 for a convention and banquet, where the eight scholarship winners are announced.

Sons of GM employees are eligible to enter the competition but in the event any of them are winners they are given duplicate awards so that all original prizes go to non-GM boys. President of the guild is T. P. Archer, vice president and group executive of GM.

Studebaker Installs New Presses

PRODUCTION of Studebaker cars and trucks, maintained at record-breaking pace since the first of the year and currently about 6200 units, weekly, was suspended July 25 for one week to permit taking annual inventory. With resumption of manufacturing operations, power was to be turned on for the first time in a new stamping division at South Bend where 61 new presses have been installed at a cost of $3 million.

Press equipment, ranging in capacity from 75 tons to 750 tons, has been set up in a one-story structure formerly used for truck chassis assembly. Remodeling of the building's interior began a year ago, after truck work had been transferred to a former aircraft engine plant purchased from the government.

New equipment will be used for stamping hood panels, fenders, grille panels, gasoline tanks, tire wells and instrument panels, with production capacity for 1500 cars per day. Among the larger presses are five 750-ton units, two 650-ton, twelve 500-ton and 29 of 95-ton rating. Some contain four or six dies each.

All sheet metal operations are on a line production basis, completely conveyorized, and include some metal finishing treaments for hoods and fenders.

Nine Million in Auto Industry

MORE figures from the latest compilation of facts on the automotive industry:

There are 1871 companies manufacturing motor vehicles, parts and accessories, better than 43,000 passenger car and truck dealerships, 8000 automotive wholesalers, 59,908 independent repair shops. In the aggregate, these businesses, along with truck driving, road building, manufacturing and allied lines, employ 9,020,000. Truck operation alone accounts for 5,077,808. However, about ninety-three per cent of all concerns engaged in motor vehicle manufacture, distribution, repair and operation have less than 20 workers.

Approximately 3,917,000 carloads of automotive freight were hauled by American railroads in 1948, including 800,000 carloads of motor vehicles, parts and tires alone. The freight bill: $815 million.

GM Assembles 200,000th Unit

THREE years after reconverting to the manufacture of passenger automobiles, General Motors Corp. has produced the 200,000th car at its South Gate, Calif., assembly plant.

This particular GM facility is notable in that its operations are among the most complex to be found in any assembly plant in the world. Forty-four different models of Buicks, Pontiacs, and Oldsmobiles move along one conveyor line, necessitating super-scheduling of the 10,000 parts required.

With 50 cars per hour coming off the line, employment at the factory has reached 2900, an increase of more than 700 over last year.

Truck Data Shown in Booklet

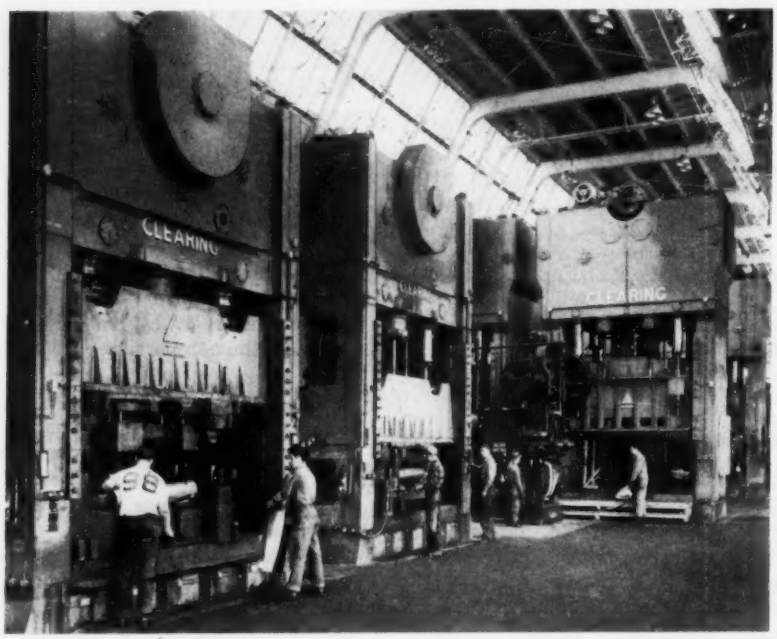
YEAR to year changes in numerous phases of truck operations are published in *Trends*, 1949 edition of the American Trucking Associations' booklet.

The 49-page publication tabulates data on growth, volume, wages, earnings and other factors. Biggest slice of wages paid by trucking industry, accounting for 50 per cent of gross revenues, goes to drivers. The booklet also points out that all types of motor trucks annually carry almost 60 per cent of nation's tonnage.

Unified Threads Booklet Out

DETAILED illustrations, tables numerical data about standards of thread form and proceedings of the meeting in which accord on unified screw threads was reached between the National Bureau of Standards and British and Canadian counterparts are available in a new booklet, "Unified Screw Threads." U. S. Government Printing Office, Washington 25, prints it. Cost is 30 cents a copy.

The present unification agreement provides a 60-degree angle and a rounded root for screw threads with either flat or rounded external thread crests. The number of threads per inch for the various series of thread diameters has been unified. Limiting dimensions for three grades to fit have also been agreed upon.



These four presses are a portion of $3 million worth of new stamping equipment installed by Studebaker Corp. at South Bend, Ind., and which will enable the company to produce stampings for 1500 cars per day. At left are two 500-ton presses while to the right is a 750-ton unit. Dwarfed between them is a 75-ton press

When These 6,377 Fasteners Pay Off!

Dark sky . . . wind . . . devastating rain mean there's no time to lose. So you give 'er everything she's got and pray you'll get in most of the crop before it's too late. That's when the holding power of the 6,377 fasteners in this combine really pay off.

1867 bolts . . . 415 cap, set and tapping screws . . . 1840 rivets . . . 2255 nuts form the steel network that locks the framing members of this combine together.

Because these fasteners are called upon to hold their own on a rugged day-in and day-out schedule, top quality is essential. That's why Russell, Burdsall and Ward with 104 years' experience still carries on intensive research and development work to improve fastener holding power further.

It is unsound economy to use inferior fasteners, since the price of fasteners is such a small part of the total product cost. It isn't the initial price but the cost of *using* fasteners that counts.

To attain *T*rue *F*astener *E*conomy, you can save assembly time, reduce plant inspection, and get the maximum holding power per dollar of fastener cost with a dependable quality fastener. *T*rue *F*astener *E*conomy contributes to the kind of production savings that put more and more combines on U. S. wheatfields every year. It is this type of contribution to major American industries that explains why—for over 104 years—RB&W has been *making strong the things that make America strong.*

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Cal. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

RB&W

6,377 Fasteners are used in 1 American Combine

104 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Armco Adds Capacity

Starts new steelmaking plant, with 400,000 tons capacity, at Middletown, O.

CONSTRUCTION of a $12 million steelmaking plant, capable of producing 400,000 tons of ingots annually, will be started immediately by Armco Steel Corp. at Middletown, O.

New plant will include three 225-ton open hearth furnaces and equipment necessary to operate the plant.

When operations start, the plant will employ 500 men.

First Unit of Larger Plant—The three open hearths now being started are planned as a unit of what Armco hopes eventually will be a much larger plant, says Charles R. Hook, chairman. The new plant is necessitated by steady growth in steel consumption in the area served by Armco's Middletown facilities. New steel-consuming companies have moved into the district, says Mr. Hook, and the company expects a more adequate steel supply will encourage others to move into the Miami Valley.

To Be Completed in 1950—Construction will be completed in about 15 months. The building housing the open hearths will be 200 x 700 feet, and will have its own chemical laboratory, office and parking lot. About 5 miles of railroad tracks will be constructed, and about 1½ miles of truck roads.

Seven thousand tons of structural steel will be needed to erect the main building, not including steel used in the furnaces. The three furnaces will require 10 million gallons of fuel oil per year to melt steel.

Blooming Mill Expansion

YOUNGSTOWN Sheet & Tube Co. will spend $4.5 million to enlarge its Campbell Works blooming mill to make larger and heavier coils of strip and sheets for the automobile industry.

President Frank Purnell said changes will make possible the rolling of slabs up to 56 inches in width. Present facilities handle 43½-inch widths. Retained profits are making the expansion possible.

New Mill for National Tube

ELECTRIC welded steel pipe mill will be constructed at National Works of National Tube Co., McKeesport, Pa. New facilities will provide for an annual capacity of 100,000 net tons of 26-inch and larger diameter electric welded and expanded steel pipe by this U. S. Steel subsidiary. Production is expected by March, 1950. Largest pipe at Lorain plant of the company is 26-inch seamless.

Construction of the mill marks a return to manufacture of large diameter pipe in the McKeesport producing area of National Tube. Until beginning of the war electric welded pipe had been made at McKeesport, but the mill was dismantled and replaced by facilities for making ordnance material: shells, bombs and rockets.

Foster Opens Houston Plant

L. B. FOSTER Co., Pittsburgh, has opened its $150,000 plant in Houston. It is the company's first plant in the Southwest and has facilities for handling steel rail and other steel products on its 12-acre site. Cost of erecting buildings plus real estate brought company's investment to $186,000.

Engineering Plant for Pontiac

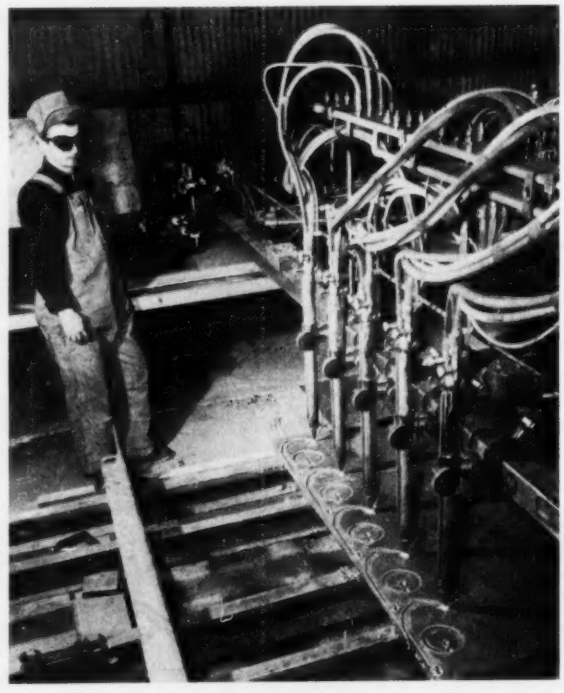
ANOTHER item in the construction news is an engineering building for Pontiac, a two-story structure of brick, concrete and steel with 213,645 sq ft of working area. It will be located in Pontiac, east of the division's parts depot. First floor will contain offices, laboratories, parking and repair garages, new model assembly, stockrooms, machine shop, sheet metal, paint and wood shops. A complete dynamometer laboratory will include engine and chassis dynamometer divisions, a minus 40° F cold room, carburetor flow room, instrument laboratory, transmission testing and stress laboratory. There will also be a copper-walled radio screen room where radios will be tested in complete isolation from outside signals. Lockrooms, lunchroom and alcoved truck wells for receiving and shipping complete the first floor.

Building's second floor will have a 700-seat auditorium and stage with turntable, a display room, drafting room, photostating and specifications rooms and offices. No date has been set for the start of construction.

Norfolk & Western Modernizes

NORFOLK & Western Railway, Roanoke, Va., has started on a $9 million equipment building program at its shops. Completion is scheduled in 1950; 1000 seventy-ton hopper coal cars are to be constructed in the latter half of this year, and 18 freight and passenger steam locomotives are to be turned out one a month.

A $13 million roadway improvement program already includes completion of a new double track tunnel and grade revision between Cooper and Lick Branch, W. Va., west of Bluefield. Equipment and roadway improvement program will be financed from treasury funds.



FANCY CUTTER: Intricate shapes can be cut with this oxyacetylene cutting machine, equipped with an electronic tracing device. It permits cuts unobtainable by other methods and eliminates the time required to make templates and does away with the template storage problem. Joseph T. Ryerson & Son Inc. have installed 11 of these devices, a product of Air Reduction Co., in their warehouses

Briefs . . . .

Paragraphs on developments of interest and significance within the metalworking industry

Gray **Iron Founders' Society,** Cleveland, has organized a management group of gray iron foundry executives in Utah. **Jack F. May,** Lundin & May Foundry Co. Inc., Salt Lake City, is chairman of the group.

—o—

Pennsylvania Salt Mfg. Co. will produce hydrofluoric acid—vital in development of atomic energy—at its new $2 million chemical plant in Calvert City, Ky.

—o—

Black, Sivalls & Bryson, Kansas City, Mo., announces addition of Snyder, Tex., to its list of stocking points for field-welded steel storage tanks and oil and gas separators. W. A. Watkins, sales and service man of company's Lafayette, La., branch has been transferred to Snyder to take charge of sales there. Mears, Mich., was added to stocking points for welded steel storage tanks.

—o—

Harnischfeger Corp., Milwaukee, manufacturer of materials handling equipment, has opened a new warehouse in Teterboro, N. J., to serve customers in the East.

—o—

Permanente Products Co., Oakland, Calif., established Kaiser aluminum distributors in Kansas City, Mo., and Phoenix, Ariz. Robbins-Benson Corp. of Kansas City will cover that trading area, and Arizona Hardware Co. will cover Arizona. Permanente has appointed Brown-Wales Co., South Boston, Mass., as jobber for Boston and the New England area.

—o—

P. R. Mallory & Co. Inc., Indianapolis, electrical products manufacturer, opens a new branch office and warehouse in Los Angeles Aug. 1. Located at 1338 S. Lorena St., the branch will be under direction of J. E. Templeton.

—o—

Hobart Brothers Co., Troy, O., has appointed J. E. White, 1802-1808 S. Seventh St., St. Louis, to distribute the Hobart line of arc welding equipment. New distributor will operate under the name of Hobart Welder Sales & Service.

—o—

American Standards Association included 140 new "American Standards" in the midyear list of standards and special publications which the association has issued. There are two new standards on small tools and machine tool elements and an American Standard Plumbing Code.

—o—

Vacuum Cleaner Manufacturers' Association has announced the sale of the 11 millionth postwar household vacuum cleaner. Before the war it took twelve years to reach the total which was attained in slightly more than three and a half years since resumption of peacetime production.

—o—

Lakeview Forge Co., Erie, Pa., has purchased the Drop Forging Division of National Lock Washer Co., Newark, N. J. W. O. English, who has been with National 15 years, is Lakeview's sales manager.

—o—

Columbia Chemical Division of Pittsburgh Plate Glass Co. has placed in operation a chlorinated benzine producing plant at Natrium, W. Va. Plant used for the division's entry into the field of organic chemical compound production is valued at $1 million.

—o—

War Assets of General Services Administration has approved sale of government-owned shipyard facilities at Orange, Tex., to Consolidated Western Steel Corp., subsidiary of U. S. Steel, for $1,001,000. Consolidated Western plans to use the property for fabrication of structural steel.

WELDING ANNIVERSARY

GROUND-BREAKING for Lincoln Electric Co.'s $8.5 million all-welded plant last week marked the 20th anniversary of welding in American construction industries. Austin Co., which erected in 1929 the four-story framework of Cleveland's Upper Carnegie Building, first commercially welded building in the U. S., is building the new Lincoln plant. Structural steel for it will be fabricated at Austin's Bliss Mill, 3000 feet from the site of the new plant.

George A. Bryant, Austin president, said the Lincoln plant will be constructed almost entirely from standard jig-fabricated H-section trusses, an application of mass production techniques to steel fabrication.

Bethlehem Steel Co. has received an award from American Institute of Steel Construction for fabricating the steel which went into the Julien Dubuque bridge over the Mississippi. A jury of architects and engineers chose the bridge as the most beautiful one in the U. S. in a class of spans over 400 feet long.

—o—

Eastern Airlines completed the second commercial flight test to determine effects of landings and flight conditions on packaged finished metal products at Cleveland. Initial test was conducted by Trans-World Airlines. Flights are conducted by nation's scheduled airlines, represented by Air Cargo Inc., and National Safe Transit committee.

—o—

Metal & Thermit Corp., New York, has added Tempil temperature-indicating products to the lines of welding accessories it distributes.

—o—

Hydro-Line Mfg. Co., Rockford, Ill., has appointed two representatives for Hydro-Line air and hydraulic cylinders and special machinery: Hydraulic Service Co., 7750 Maryland St., Philadelphia, for the Philadelphia area and Alton J. Fabrey, 227 Fourth St., Scotia, N. Y., for western New York territory.

—o—

Clearing Machine Corp., Chicago, manufacturer of presses, has named dealers in four areas: Harrington-Wilson-Brown, New York, will serve Connecticut and eastern New York; J. F. Owens Machinery Co., Syracuse, N. Y., Syracuse; F. W. Shiefer Machinery Co., Rochester, N. Y., Rochester; and R. L. Crane Machinery Co., Buffalo, for that city.

—o—

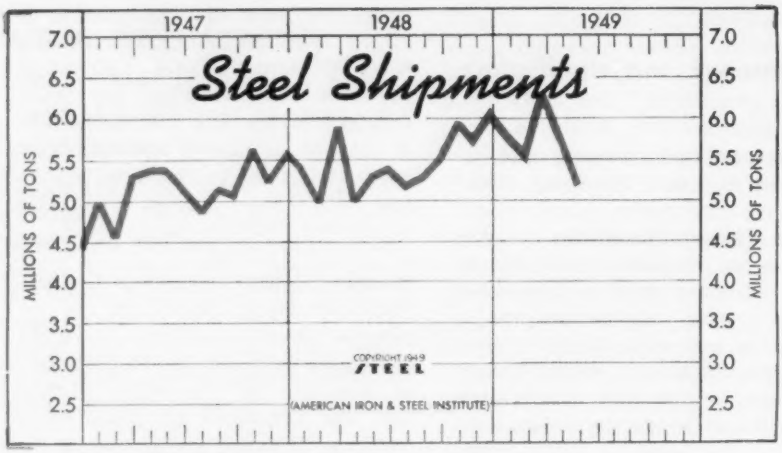
Revere Copper & Brass Inc., New York, has added a new 8-cup drip coffee maker to its line of copper clad, stainless steel kitchen utensils. Another addition is a Revere utensil rack.

—o—

Dravo Corp., Pittsburgh, has published a 48-page booklet, "The Development and Economic Potential of Inland Waterways Transportation," based on a comprehensive study of such waterways in the U. S. and South America. It describes advancement in design and manufacture of vessels that operate over these routes.

—o—

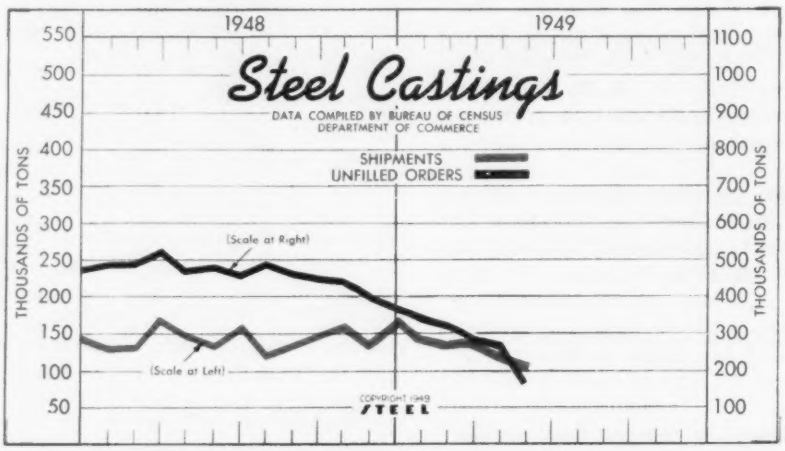
Federal Machine & Welder Co., Warren, O., will consolidate operations of Warco Press Division and Welder Division in its plant on the outskirts of Warren.



Steel Shipments

(Net Tons)

	1949	1948	1947
Jan.	5,788,632	5,410,438	5,061,333
Feb.	5,519,938	5,046,115	4,626,424
Mar.	6,305,681	5,978,551	5,304,415
Apr.	5,596,786	5,096,161	5,445,993
May	5,234,862	5,321,375	5,442,343
June	.....	5,476,774	5,263,711
July	.....	5,229,880	4,974,566
Aug.	.....	5,329,060	5,278,223
Sept.	.....	5,511,474	5,118,839
Oct.	.....	5,952,008	5,681,597
Nov.	.....	5,732,256	5,216,990
Dec.	.....	6,056,282	5,613,036

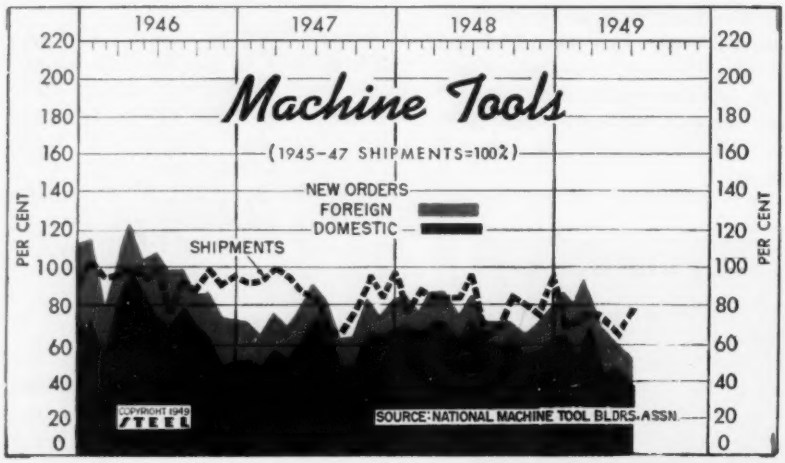


Steel Castings

(Net tons in thousands)

	Shipments			Unfilled Orders*		
	1949	1948	1947	1949	1948	1947
Jan.	140.6	141.1	139.0	338.9	491.7	365.5
Feb.	135.0	142.4	125.6	320.2	497.1	421.4
Mar.	138.9	162.9	134.9	284.8	508.8	434.9
Apr.	120.0	150.3	144.2	250.5	472.4	427.6
May	106.2	143.3	140.9	191.5	482.5	443.2
June	....	152.9	139.0	....	470.0	445.5
July	....	120.4	117.0	....	497.4	473.9
Aug.	....	140.2	120.4	....	472.5	478.6
Sept.	....	149.2	137.4	....	448.0	526.2
Oct.	....	153.0	148.4	....	424.5	497.3
Nov.	....	146.8	130.1	....	395.0	493.3
Dec.	....	157.4	148.1	....	354.5	489.4

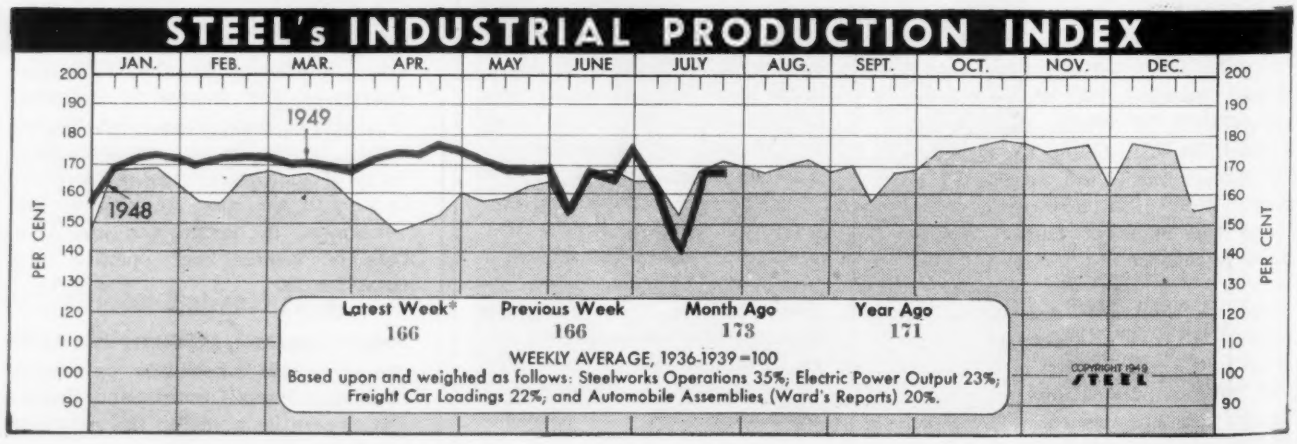
* Castings for sale.



Machine Tools

(1945-47 Shipments = 100)

	Orders				Shipments	
	Total		Domestic			
	1949	1948	1949	1948	1949	1948
Jan.	87.0	83.1	65.1	69.1	68.8	75.3
Feb.	80.9	77.3	54.4	64.6	70.3	87.1
Mar.	93.5	86.3	71.2	70.2	75.8	83.6
Apr.	70.1	86.3	47.0	72.2	74.7	82.0
May	63.7	73.5	47.9	62.1	72.8	82.6
June	53.8	83.4	38.0	71.5	79.0	94.4
July	...	74.0	...	61.1	...	62.4
Aug.	...	73.7	...	60.9	...	69.8
Sept.	...	73.1	...	61.5	...	84.7
Oct.	...	67.4	...	53.4	...	80.4
Nov.	...	72.2	...	54.1	...	76.2
Dec.	...	76.7	...	60.5	...	96.9



*Week ended July 23 (preliminary).

The Business Trend

INDUSTRIAL activity in the week ended July 23 was unchanged from the preceding week, with STEEL's industrial production index at a preliminary 166 per cent of the 1936-1939 average. In the corresponding week last year the index was 5 points higher. Decreased carloadings and slackened activity in the steel industry more than wipe out the gain in automobile assemblies, causing the index to fall below the year ago mark.

AUTOMOBILES — Assembly schedules continue to call for an all-out effort by the industry with overtime required in many instances to reach production goals. Outturn in the week ended July 23 was 156,100 passenger cars and trucks, just below the all-time weekly high of 156,436 assemblies in the preceding week. Despite the unprecedented rate of activity, automobile builders find demand continuing high and are aiming for greater production where possible.

STEEL—The ingot rate was unchanged in the week ended July 23 at 77 per cent of capacity. This is the first leveling off since the decline began in the middle of March. Operations turned upward in the week ended July 30.

COAL—Bituminous coal output in the week ended July 16 moved up to 6.6 million net tons from about 4.9 million tons in the preceding week. The three-day work-week continues in effect, holding production well below the 12.3 million tons mined in the corresponding week of 1948.

CONSTRUCTION—Civil engineering construction volume in the week ended July 21 totaled $158.8 million, 11 per cent above the corresponding week last year. Private construction, however, was 7 per cent below the corresponding week last year. The cumulative total of nearly $4.5 billion for the first 29 weeks of this year betters the corresponding 1948 total by 17 per cent. June building permits reported by Dun & Bradstreet Inc. reached a record volume of $394 million for the month and were topped only on two occasions since the series was started in 1927.

RAILROADS — Association of American Railroads says more locomotives and freight cars were installed by Class 1 railroads in the first half of 1949 than in any corresponding period in a quarter of a century. New locomotives numbered 1010 for the best mark since 1923. These included 969 diesel and 41 steam. On order at the start of the second half were 29 steam, 4 electric and 1094 diesel locomotives. The 55,168 freight cars put in service in the first half of 1949 topped all totals for a corresponding period since 1925.

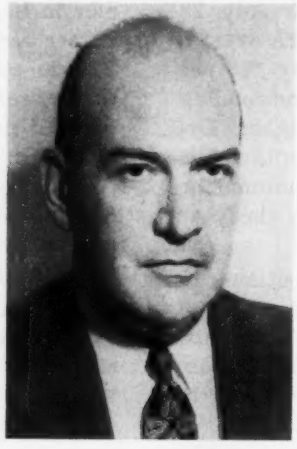
BUSINESS—June business failures, as reported by Dun & Bradstreet Inc., resumed an upward trend after a decline in May. Total failures numbered 828 with liabilities of $28.2 million. Corresponding May totals were 776 and $28.4 million. Bulk of June failures came in concerns with liabilities of $5000 to $25,000 with 415 companies included in this category. Failures involving liabilities from $100,000 to $1 million rose to 52 in June from 42 in May.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	77.0	77.0	84.5	93.0
	Electric Power Distributed (million kilowatt hours)	5,461	5,342	5,466	5,342
	Bituminous Coal Production (daily av.—1000 tons)	1,100	814	350	2,046
	Petroleum Production (daily av.—1000 bbl)	4,684	4,671	4,889	5,448
	Construction Volume (ENR—Unit $1,000,000)	$158.8	$190.3	$215.7	$143.2
	Automobile and Truck Output (Ward's—number units)	156,100	156,436	153,001	118,797
	*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.				
TRADE	Freight Car Loadings (Unit—1000 cars)	710†	724	803	883
	Business Failures (Dun & Bradstreet, number)	182	167	196	91
	Money in Circulation (in millions of dollars)‡	$27,366	$27,480	$27,345	$27,864
	Department Store Sales (changes from like wk. a yr. ago)‡	−10%	−7%	−8%	+9%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$13,164	$13,196	$15,453	$14,257
	Federal Gross Debt (billions)	$252.9	$252.8	$251.3	$253.4
	Bond Volume, NYSE (millions)	$22.9	$15.1	$13.4	$20.0
	Stocks Sales, NYSE (thousands)	5,286	4,561	3,405	6,906
	Loans and Investments (billions)†	$62.9	$62.6	$62.6	$62.9
	United States Gov't. Obligations Held (millions)†	$35,254	$34,735	$34,867	$34,656
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Composite Finished Steel Price Average	$91.82	$91.82	$91.82	$89.09
	STEEL's Nonferrous Metal Composite‡	175.9	174.1	165.0	201.3
	All Commodities†	154.3	154.2	153.0	168.8
	Metals and Metal Products†	167.8	167.6	165.7	159.2
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100.				

Men of Industry

ROBERT C. OVERSTREET



W. H. TAYLOR

STANLEY J. ROUSH

Robert C. Overstreet has been named secretary of Tinnerman Products Inc., Cleveland. **W. H. Taylor** has been elected assistant to the vice president; **L. H. Flora,** chief engineer and **R. A. Hartman,** manager of field engineering. In addition Mr. Flora and Mr. Hartman were appointed to the company's executive committee. Mr. Overstreet, formerly executive assistant to the general manager, has been associated with Tinnerman since 1941. Mr. Taylor, who was named director of engineering a year ago, joined the company in 1945. Mr. Flora, formerly chief development engineer, will now direct all phases of product, development and research engineering, and Mr. Hartman, formerly chief product engineer, will provide special technical service to Tinnerman customers.

—o—

Worthington Pump & Machinery Corp., Harrison, N. J., announces appointment of **John P. McArthur** as manager, West Coast sales, with headquarters in San Francisco. He will supervise activities of the Los Angeles, San Francisco, Seattle and Salt Lake City, Utah, district offices. He has been manager of the San Francisco district office since 1945.

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J. P. Molis, formerly district manager, industrial maintenance department, Diversey Corp., Chicago, has been named promotional manager of the newly formed maintenance department, which replaces two former sales departments, the industrial maintenance and institutional.

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William S. Lowe has been elected executive vice president, A. P. Green Fire Brick Co., Mexico, Mo. He previously was with Reeves-Ely Laboratories Inc., New York, in connection with which he served as chairman of the board and president, Winsted Hardware Mfg. Co., Winsted, Conn.; chairman of the executive committee, director and treasurer, American Transformer Co., Newark, N. J.; and vice president, Waring Products Corp., New York.

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F. S. Cornell has been named manager, Water Heater Division, A. O. Smith Corp., Milwaukee. He was assistant manager of the division, which operates the Kankakee, Ill., works.

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J. W. Bramley has been appointed manager of the new Boston district sales office of Babcock & Wilcox Tube Co. For the last nine years he has been connected with the Technical Sales Divisions of J. E. Raney & Co. and Lincoln Electric Co. in the New England district.

—o—

E. E. Goehringer has been appointed Indianapolis sales and engineering manager for Lincoln Electric Co., Cleveland, and **Omer Blodgett** has been transferred from the Grand Rapids, Mich., office to the Chicago office. He has been an engineer with Lincoln since 1945.

—o—

Victor N. Chambless, for the last nine years associated with the Warehouse Division, Ingalls Iron Works Co., Birmingham, has been promoted to division manager.

—o—

J. J. Kelleher has been named assistant sales manager, a newly created post of Hercules Powder Co.'s explosives department, Wilmington, Del., and **L. C. LeBron** has been appointed to succeed Mr. Kelleher as manager of the Contractors Division, where he has been assistant manager.

—o—

Stanley J. Roush has been elected president and general manager of Kerotest Mfg. Co., Pittsburgh. **Walter G. Swaney** has been elected vice president and secretary, and **R. E. Lane** as treasurer. New directors are **Robert C. Downie** and **John D. Dupuis.**

—o—

William H. Compton, who has served as manager of the Rockford, Ill., sales office, Reliance Electric & Engineering Co., Cleveland, for the last four years, has been made supervisor of standard motor sales, with headquarters in Cleveland.

—o—

G. H. Smith, formerly Philadelphia zone manager, has been appointed Atlantic Coast regional manager, Oldsmobile Division, General Motors Corp. He succeeds **F. Q. Murphy,** assistant sales manager, who has been given a disability leave of absence. **L. L. Johnson,** administrative assistant to the general sales manager, succeeds Mr. Smith in Philadelphia.

—o—

Lawrence T. Greiner succeeds **Frank E. Titus,** retired, as manager of the Pacific Coast division of the Replacement Tire Sales Division, B. F. Goodrich Co., Akron, with headquarters in Los Angeles. Mr. Greiner has been manager of the southwestern division of replacement sales with headquarters in Kansas City. He is succeeded in that post by **Conrad R. Helms,** formerly manager of the Charlotte, N. C., sales district. **Frank C. Haralson** succeeds Mr. Helms, and is, in

Is OVERHEATING your magnet problem?

The husky load of scrap in the photograph weighs practically the same as the first load lifted eight hours earlier. Why?

Ohio Magnets lift efficiently—*uniformly*—over extended periods of operation because they operate *cooler*. Copper coils are heavier-duty, carefully sealed with plenty of non-cracking asphaltum.

Uniform lifting capacity is one of the reasons why more mills are standardizing on Ohio. Satisfy yourself. Send your next order to Ohio—*25 years a leader in magnetic materials handling.*

This magnet lifts big loads all day long!

OHIO PROTECTO-WELD MAGNET is welded *on top,* where weld cannot be dented in. Sizes include 39, 46, 55 and 65-inch diameters. Ohio also builds magnet control equipment.

THE OHIO ELECTRIC MFG. CO. • 5900 MAURICE AVENUE • CLEVELAND 4, OHIO

ohio MAGNETS

A-2027

turn, succeeded by **Donald C. Lacy** as regional store manager of the southeastern division with headquarters in Atlanta. **William H. Bowdle** has been appointed credit and operations manager of N. V. Nederlandse B. F. Goodrich Co., The Hague, Holland, a subsidiary selling company of International B. F. Goodrich Co. Mr. Bowdle succeeds **W. A. Beck,** named sales manager of the Holland company.

—o—

Charles S. Freeman has been appointed sales representative for Reed Engineering Co., Carthage, Mo., on turning rolls and special welding jigs and fixtures in the Buffalo area. Mr. Freeman formerly was with Lincoln Electric Co., and left that company in 1948 to start his own business as a manufacturer's agent and welding consultant.

—o—

Francis R. O'Leary has been promoted to the post of general manager, and **George W. Brady** to director of engineering, Propeller Division, Curtiss-Wright Corp., New York. Mr. O'Leary was previously factory manager at the company's Caldwell, N. J., plant, and Mr. Brady has been chief engineer, Propeller Division.

—o—

John C. Blake has been appointed general manager, Phosphor Bronze Corp., operation of which has been moved from Philadelphia to Seymour, Conn. He resigned as general sales manager of Riverside Metal Co., Riverside, N. J., in June after 24 years of association with that company, serving in various executive assignments. Mr. Blake started his career in the brass mill industry as a clerk in the wire mill of Seymour Mfg. Co., Seymour, Conn., in 1915.

—o—

C. Stuart Hall has been appointed to the newly created post of assistant to the president, American Can Co., New York. He formerly was vice president, Carl Byoir & Associates Inc., New York, public relations firm.

—o—

W. E. Jacobsen has been appointed assistant manager of the Federal & Marine Engineering Division, General Electric Co., Schenectady, N. Y. **Alexander Kennedy Jr.,** assistant to the manager of the company's Aircraft, Federal & Marine Divisions in charge of engineering, has retired after 41 years with the company. **Edward J. Roddy Jr.** has been named a district representative for the construction materials department, and will cover the wholesale trading areas of Zanesville and Columbus, O., making his headquarters in the latter city.

—o—

C. H. Bartlett has been appointed sales manager, Transformer Division, Sharon, Pa., for Westinghouse Electric Co., Pittsburgh. He succeeds **W. W. Sproul,** who has been named sales manager of industrial products for the entire company. **B. K. Strader** has been appointed eastern district manager of the company's Elevator Division.

—o—

W. A. Marsteller and **Robert P. Melius** have been elected vice presidents of Rockwell Mfg. Co., Pittsburgh. Mr. Marsteller has been manager of advertising and market research for the company, as well as vice president of Edward Valves Inc., East Chicago, Ind. Mr. Melius was recently placed in charge of sales for the newly created Power Tool Division, which will market Delta, Crescent, Multiplex and Delta-Homecraft wood and metalworking tools. He has been with the Delta Mfg. Division for 19 years, and sales manager since 1935. **W. E. MacMullan** has been appointed general manager of the company's Monessen Foundry Division. He has been in business for himself for the last four years as a manufacturer's agent, handling industrial mining equipment and supplies, and had former association with Crane Co. and Webster Mfg. Co.

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Thomas J. Tobin, railroad comptroller, Erie Railroad, Cleveland, has been elected to a newly created position of vice president and comptroller.

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Walter J. McGrath, former business management manager, Pontiac Motor Division, General Motors Corp., in the Chicago zone, has been promoted to assistant manager of the Pontiac, Mich., zone, succeeding **Sidney G. Whiting,** who has been appointed manager of the newly created Charlotte, N. C., zone.

—o—

Russell H. Colley has been appointed to the New York staff of McKinsey & Co., Chicago. He will be a consultant in the marketing field. Recently associated with A. S. Bennett Associates Inc., he was previously supervisor of consumer research for the appliance & merchandise department, General Electric Co.

—o—

Arthur L. Berry, formerly special assistant to the president, Pullman-Standard Car Mfg. Co., Chicago, has been appointed acting director of public relations. **E. Preston Calvert,** formerly connected with Carl Byoir & Associates Inc., has been named assistant director of public relations, and **Hugh W. Foster,** special assistant in charge of advertising.

—o—

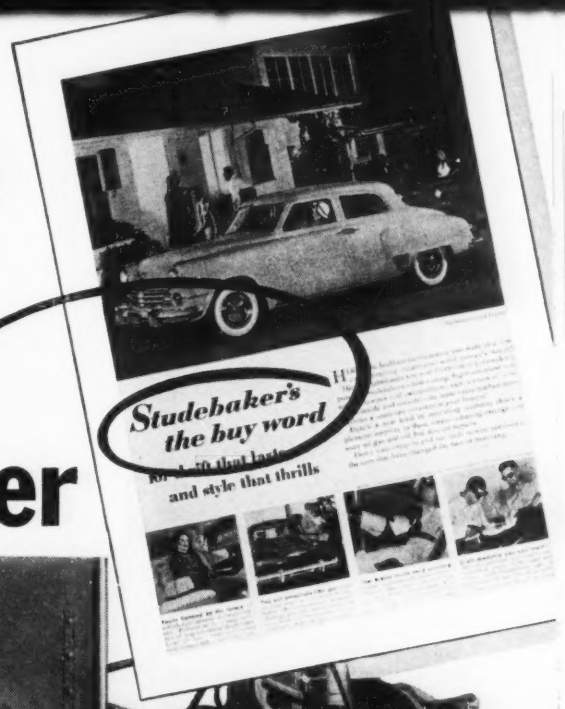
Alfred E. Giblin has been named assistant plant manager, Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp., at Buffalo. He succeeds **Graham W. Wickizer,** who has returned to the company's Pueblo,

JOHN C. BLAKE

W. A. MARSTELLER

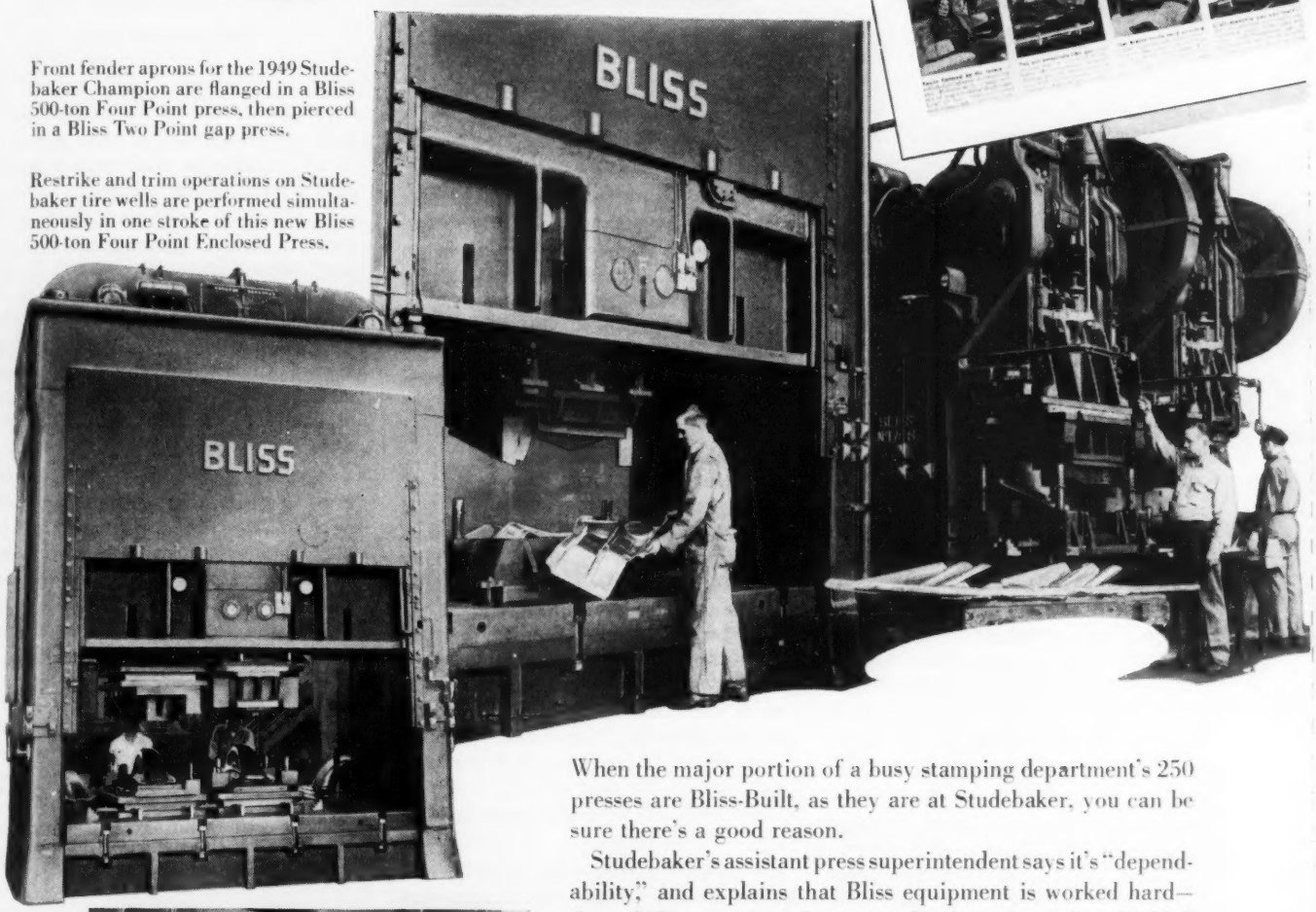
ROBERT P. MELIUS

...and BLISS is the press buy word at Studebaker



Front fender aprons for the 1949 Studebaker Champion are flanged in a Bliss 500-ton Four Point press, then pierced in a Bliss Two Point gap press.

Restrike and trim operations on Studebaker tire wells are performed simultaneously in one stroke of this new Bliss 500-ton Four Point Enclosed Press.



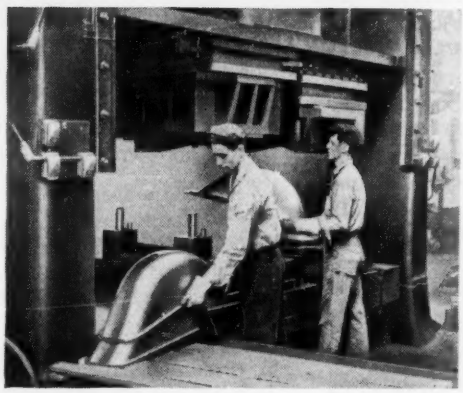
When the major portion of a busy stamping department's 250 presses are Bliss-Built, as they are at Studebaker, you can be sure there's a good reason.

Studebaker's assistant press superintendent says it's "dependability," and explains that Bliss equipment is worked hard—three shifts—year-in and year-out. Yet downtime is "negligible."

Such dependability begins with the prompt and practical on-the-scene assistance that Bliss engineers bring to the working-out of a pressed-metal problem—in matching the press to the job for maximum, low-cost production. And back of it is Bliss' 90-year fund of press-building knowledge, built into its complete line of mechanical and hydraulic presses.

That's why at Studebaker, as among so many major mass-producers, the buy word for presses is "BLISS."

You'll like talking over your pressed-metal problem with a Bliss Sales Engineer. Why not call him in now?



Double die set-up in another 500-ton Bliss press for restriking and trimming tire wells.

E. W. BLISS COMPANY, TOLEDO 7, OHIO

Mechanical and Hydraulic Presses, Rolling Mills, Container Machinery

BLISS BUILDS MORE TYPES AND SIZES OF PRESSES THAN ANY OTHER COMPANY IN THE WORLD

MARQUETTE · BLISS · CONSOLIDATED · TOLEDO
BLISS BUILT

CAMERON R. WHITEHORNE

O. L. PRINGLE

LAURENCE S. DAHL

Colo., plant. Mr. Giblin was formerly superintendent of the mason labor department. Other personnel changes at the Buffalo plant are: **J. Wilbur Campbell,** formerly assistant superintendent of wire mill, has been appointed superintendent, succeeding **A. J. LaBlanc,** resigned; **Victor Nicoli,** assistant wire mill superintendent at San Francisco, appointed to the same position at Buffalo; and **Eugene J. Songer,** foreman, appointed superintendent of mason labor department.

—o—

Cameron R. Whitehorne has been appointed comptroller, and **William F. Munday,** deputy comptroller of International Nickel Co. of Canada Ltd., and its United States subsidiary, International Nickel Co. Inc., New York. Mr. Whitehorne succeeds **Frederick P. Bernhard,** retired, and Mr. Munday succeeds Mr. Whitehorne, who since 1933 has been deputy comptroller of both companies, and also of Whitehead Metal Products Co. Inc., an affiliate.

—o—

Martin J. O'Brien, assistant works manager, Symington-Gould Corp., Rochester, N. Y., has been promoted to works manager. He succeeds **Thomas W. O'Hara,** retired.

—o—

Henry W. Dodge has joined Mack Trucks Inc., New York, as executive vice president, with special responsibility for sales and advertising. Mr. Dodge, chairman of the board and director of Air Products Inc. at the time of acceptance of his new position, was on loan to ECA as chief of petroleum on the staff of Ambassador **W. Averell Harriman** in Paris. He resigned both positions as of June 30.

—o—

Marvin T. Arnsdorff Jr. has been named advertising manager of Southern States Iron Roofing Co., Savannah, Ga. He was formerly manager of general advertising, and replaces **E. C. Boyce,** resigned to accept a position on the Pacific Coast.

—o—

O. L. Pringle has been elected vice president in charge of sales, and **Laurence S. Dahl,** vice president in charge of operations of Columbia Steel Co., San Francisco, West Coast subsidiary of U. S. Steel Corp. Mr. Pringle, who formerly served as vice president in charge of operations, succeeds to the position left vacant by the death of **Frank B. DeLong.** Mr. Dahl was formerly general superintendent of Youngstown district operations of Carnegie-Illinois Steel Corp., another U. S. Steel subsidiary, and is succeeded in that position by **John W. Humphrey,** who served as assistant general superintendent at Youngstown. **H. S. Worthington** was appointed assistant to the vice president in charge of operations, and will work with Messrs. Pringle and Dahl in co-ordinating customer requirements with Columbia's steel products and operations, and dealing with development of new steel products.

—o—

Arrow-Hart & Hegeman Electric Co., New Britain, Conn., announces five promotions and additions in the sales department: **Howard J. Varley,** sales manager of Appliance Division, promoted to assistant director of sales for the company; **Gordon Britt,** appointed to succeed Mr. Varley; **P. T. Galt Jr.,** appointed manager, Industrial Controls Division; **Charles H. Tuttle,** appointed sales manager; and **John C. Ellis,** appointed assistant sales manager of the latter division.

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Alan Stubbs has been appointed general sales manager, Bryant Chucking Grinder Co., Springfield, Vt., succeeding **W. M. Smith,** resigned.

—o—

Henry J. Morton, formerly president, Morton Gregory Corp., Toledo, O., has been elected to the newly created post of chairman of the board of directors, and is succeeded as president by **George E. Gregory,** formerly vice president, who continues in his present post of general manager of the corporation. **Verne W. Bender** has been appointed manager of distributor sales for the Nelson Stud Welding Division, Lorain, O. He has served since 1945 as special representative and field engineer for the division in the San Francisco Bay area.

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Paul R. Brousse has been named manager of Western Electric Co.'s western zone, with headquarters in San Francisco. He succeeds **C. H. Hanson,** who has been appointed manager of the company's plant in Tonawanda, N. Y.

—o—

Edgar Vail and **L. L. Cole,** associated with Wigton-Abbott Corp., Plainfield, N. J., have been elected vice president and secretary, respectively, of the General Building Contractors Association of Plainfield and vicinity.

—o—

Samuel H. Reynolds has been appointed sales manager, Electrode Division, Great Lakes Carbon Corp., Niagara Falls, N. Y., succeeding **George O. O'Hara,** resigned to establish his own sales agency in California.

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C. G. Eickmeyer has been appointed manager of the Foundry Division, Hansell-Elcock Co., Chicago.

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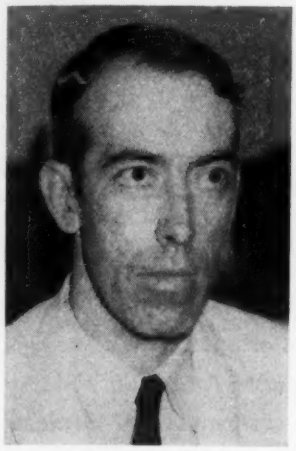
F. B. Atwood, formerly supervisor of industrial engineering and production control, has been appointed manufacturing superintendent for the radio tube plant of Sylvania Electric Products Inc., New York. He has been



FRED H. PILLSBURY

Appointed vice president in charge of operations, Century Electric Co., St. Louis. Noted in STEEL, July 25 issue, p. 55

WOODARD G. JESCHKE

Named president, Pressed Metal Institute, at the annual convention held in Cleveland. Noted in STEEL, July 25 issue, p. 34

K. W. RHOADS

Heads sales activities in the East for Detroit Electric Furnace Division, Kuhlman Electric Co. Noted in STEEL, July 25 issue, p. 52

supervisor of industrial engineering at the Huntington, W. Va., plant.

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George F. Ritenbaugh, secretary-treasurer, Heppenstall Co., Pittsburgh, has retired after 40 years' service with the company.

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Edwin D. Scott has joined Peninsular Metal Products Corp., Detroit, as chief engineer.

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American Steel & Wire Co., Cleveland, U. S. Steel Corp. subsidiary, announces changes in the company's district operating staff: **L. J. Westhaver,** general superintendent, Donora, Pa., Steel & Wire Works, has been named Duluth district manager of operations, succeeding **B. E. Pheneger,** appointed assistant to the vice president of operations, with headquarters in Cleveland. **Harold Cope,** general superintendent, Central Furnaces & Coke Works, replaces Mr. Westhaver at Donora, and Mr. Cope is succeeded by **Harry O. Johnson,** former superintendent of the Donora blast furnaces. **Jacob W. Cox,** assistant to the coke works superintendent in Cleveland, replaces Mr. Johnson.

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John R. Kingman has been appointed sales manager, Railway Division, National Malleable & Steel Castings Co., with offices in Richmond, Va. He succeeds **William Blackmore,** retired after 43 years of service. Mr. Kingman joined the engineering department of the company at Cleveland in 1946 and was subsequently transferred to the St. Louis office as a field engineer. In 1947 he was appointed assistant manager of sales, Railway Division, in Richmond.

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Wellman Bronze & Aluminum Co., Cleveland, has appointed **George Grant** as West Coast representative. For 20 years Mr. Grant was associated with W. S. Tyler Co., Cleveland. Since 1945 he has been a manufacturers' representative.

OBITUARIES . . .

Pearce F. Boyer, 62, vice president, comptroller and a director of Republic Steel Corp., Cleveland, died July 22. He was comptroller of Donner Steel Co., Buffalo, when that concern was merged with three other steel manufacturers in 1930 to form Republic Steel Corp.

—o—

William M. Shanahan, 49, secretary and treasurer, Consolidated Vultee Aircraft Corp., San Diego, Calif., died July 15. He became treasurer of the corporation in 1937, and with the merger of Consolidated and Vultee Aircraft in 1943, became secretary and treasurer of the new company.

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Auguste J. Cordier, 58, president, Lalance & Grosjean Mfg. Co., New York, died July 20.

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Dr. Fritz J. Hansgirg, 58, Austrian metallurgist and inventor of the Hansgirg carbothermic method of processing magnesium, died in New York July 22. He sold the American rights to his process to Henry Kaiser in 1941, and built for him the Permanente plant, San Jose, Calif.

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Edward J. Burnell, vice president, Link-Belt Co., Chicago, died July 22.

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James M. Davidson, 44, superintendent, Buffalo plant, Farrel-Birmingham Co. Inc., Ansonia, Conn., died July 15 following a brief illness.

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Charles G. Connors, 65, president and manager, Kyle & Co., Fresno, Calif., died July 17.

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Henry O. Magnuson, 60, manager, Champion Foundry & Machine Co., Rockford, Ill., died July 19 of a heart attack. He had been one of the organizers of the company 34 years ago.

—o—

Benjamin A. Gramm, 76, pioneer manufacturer of a truck that bore his name, died July 18. He retired five years ago, but retained the board chairmanship of Gramm Trailer Corp., Delphos, O.

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Carleton E. Saunders, 71, founder of Kerby Saunders Inc., New York, died July 19. He was chairman of the board of the corporation until his retirement in 1945.

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J. Stanley McClenahan, 60, metallurgical engineer, who helped build copper and oil refining installations in the United States, Latin America and Russia, died July 13 at his home, Toms River, N. J.

—o—

William M. Kelly, 73, a former member of the inspection division, Watson-Stillman Co., Roselle, N. J., died July 22.

—o—

Edwin J. Olson, 54, president, Nonferrous Foundry Inc., Philadelphia, died July 23.

—o—

George H. Gordon, 65, vice president, Dominion Foundries & Steel Co. Ltd., Halifax, N. S., died July 25.

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Send for 16 page illustrated catalog.

THE AMERICAN WELDING AND MANUFACTURING COMPANY

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Engineering News . . . AT A GLANCE

LIQUID IMPACT METHOD— Blanks from silicon sheet steel can be satisfactorily made by using liquid instead of metal punches, engineers of General Electric's works laboratory in Schenectady, N. Y., discovered recently. The method substitutes a column of oil for the punch, and makes it possible to employ soft, unhardened steel dies during the operation. For each particular size and thickness of steel, it is reported, it is necessary to calculate the particular impulse force to achieve a satisfactory blank. Technique, however, is still in the experimental stage.

STOPS CORROSION— Two forms of internal corrosion known to attack fire extinguishers of the vaporizing, liquid pump type are eliminated by a new tinning process developed by American-La France-Foamite Corp., Elmira, N. Y. Plating method, according to the company, resists acid attack and eliminates electrolytic action caused by the presence of dissimilar metals. Its application is said to more than double the life of the extinguishers.

OPERATOR-STRESSING STRESSES— Misalignment of machines due to stresses in the floor can amount to several thousandths of an inch, it was pointed out recently by George Brinkman of Ex-Cell-O Corp., Detroit. When a large precision machine produces satisfactory work one day and faulty the next under identical conditions, it is safe to assume the machine base is being distorted. Few persons realize how normal movement of a perfectly good concrete floor can bend and twist a machine bolted to it. A spindle, he stated, can be thrown out of alignment with the fixture or two aligned spindles on individual slides can be knocked out of line. Ways of the spindle slides can be bowed, causing not only inaccurate work, but also excessive wear.

HEAT TREATED BY THE BASKET—From start to finish, no manual handling is involved in heat treating golf club shafts in the plant of the True Temper Corp., Geneva, O. Electric heat treating processes employed are set up to harden and draw some 9600 shafts during each 8-hour shift. Shafts are dropped one by one through an automatically opening slot on top of a vertical retort electric furnace. A revolving basket inside the furnace receives the shafts as they enter, holding 32 at a time. After about 3 minutes, shafts are released from the basket, again automatically, dropping through a door in the furnace bottom, "landing" in a race-track like salt bath tank. A conveyor moving around above the tank carries the shafts in tall narrow baskets through the hot liquid salts. At the discharge point, each basket is lifted out of the bath by means of a small hoist for further processing.

TINY OPERATION— Effect of various elements in iron upon iron's ability to absorb carbon is being studied by Dr. Fred C. Barbour, chief chemist, and W. M. Spradlin, melting supervisor, McWane Cast Iron Pipe Co., Birmingham, with the aid of a 3-inch experimental cupola that stands on a 10 x 12- inch block. Midget unit is said to operate in a manner comparable to a much larger cupola when size of iron, coke and flux charges, and the blast are reduced to proportionate amounts to correspond to its cross-sectional area. Charges are made up of ½-pound of iron, 1 ounce of coke and 17 grams limestone. Six equally-spaced tuyeres are included in the unit.

PIGMENT VITAL ELEMENT — In cold shaping steel at higher unit pressures, properties of the lubricant—slipperiness and film strength—are not entirely effective against pick-up and galling by welding. It is pointed out, that at higher pressures the inclusion of a pigment is often advantageous as it tends to separate sliding metal surfaces. A well interlocked coating, such as a phosphate coating, considered a fixed inorganic pigment type, creates the best lubricating conditions by offering greatest resistance against high unit pressures. (p. 74)

NO HAND-HANDLING — Bearings processed for springless dial scales currently manufactured in the plant of Yale & Towne Mfg. Co., Philadelphia, are untouched by the human hand, since the slightest foreign particle may cause more friction than can be tolerated in the precise, efficient operation of the scales. Components are cleaned, lubricated, tested and assembled in a dustless room by girls wearing nylon smocks and caps. (p.78)

"TRAVELING" STEEL — Following cold reduction, the coils of steel that are to be transformed into tin plate are subjected to several fast processing operations prior to the tinning phases. For example, in removing surface oils from the strip, the coils are put through an alkali cleaning sequence. This is an operation that is carried out at speeds up to 2500 feet per minute. Later on, during the temper mill "treatment" the traveling strip is rolled at speeds as high as 4000 feet per minute. Last operation is the one that imparts to the steel a smooth bright surface required for subsequent tinning. (p. 82)

"SKYHOOK" DELIVERY — Out on the West coast, physical plant limitations presented no problem to Bethlehem Pacific Coast Steel Corp. in transferring products of its rod mill to the wire mill. Handling system involves the use of a hook conveyor that picks up the coiled rods automatically from the chain conveyor and carries them up a slope for about 600 feet. It then turns 90 degrees and travels horizontally across the mill building at about crane-girder level. (p. 96)

Cold Shaping

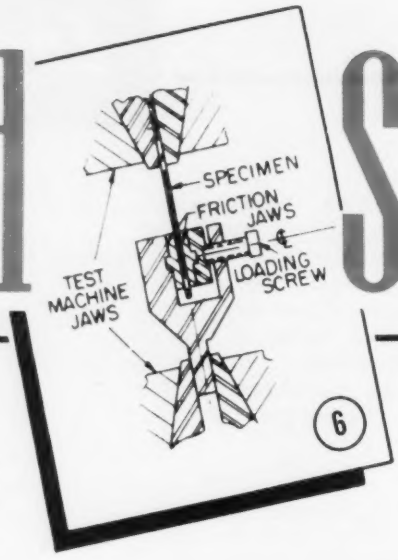


Fig. 6 — Schematic diagram of arrangement for friction setup

In this second and concluding article based on Department of Commerce summary report PB96704, phosphatizing processes and their importance in facilitating cold shaping of metals are discussed

PHOSPHATIZING has been used increasingly for many years in industry and now has four main purposes: Increase corrosion resistance, improve organic finishes (lacquers, varnishes, etc.), diminish friction of sliding metals, facilitate cold shaping of metals. Essentially, phosphatizing is the treatment of steel or other metals with an acid phosphate solution by dipping or spraying. Processing time is dependent upon composition of the solution, shape and quality of material to be processed and type of coating desired. It may be from a few seconds to 1 hour. The operating temperature may vary from 60 to 210° F. Application of phosphate coating is limited to iron, steel (with limiting alloy content), zinc and its alloys and in some instances to aluminum and its alloys.

Phosphatizing and Cold Working—Economical mass production necessitates the inclusion of suitable oxidants and the particular phosphatizing solution, such as zinc phosphate solutions, which incidentally produce the most commonly used phosphate coating. Coating thickness and crystal size must be adaptable to the particular cold working process. It follows, therefore, that the chemical composition of the solution and the actual method of production is dependent on the cold working process to be used. There are, however, several general conditions and properties which are not dependent on the cold working process. These are: Formation of the coating upon the entire surface to be worked; uniformity of the coating; complete interlocking of the coating; selection and application of lubricant to give the highest combined effect.

As concerns coating thickness, it may be said in general that a thick coating must be applied to a piece which is to be heavily cold worked, which working results in a relative increase in the surface area. Thin coatings are applied when final surface area approximates that of the original.

Following are the general applications of phosphate coatings to cold working: (1) Drawing: Wire, tube, profiled shapes. (2) Stamping: Deep drawing (cupping using blank holders), deep drawing and forming (auto body parts), heading of screws, bolts, rivets. (3) Cold shaping: Drawing or ironing shells, extrusion (both forward and backward).

Phosphatizing is limited to the following types of steel: (1) Carbon steels: Low carbon (SAE 1010), medium carbon (SAE 1040), high carbon (0.75 C or higher). (2) Alloy steels having ferritic structures; also, at times, zinc or aluminum and their respective alloys.

Lubrication Characteristics—In general, the function of lubricants is to separate two metal surfaces which slide under pressure, so that instead of the greater "dry" friction occurring between metal and metal, the lesser liquid friction occurs.

A lubricant may perform two distinct types of lubrication, depending upon the pressure to which it is subjected, its composition and its viscosity.

(1) In total liquid lubrication which effects the complete separation of the two sliding metal surfaces by a liquid film, the total resistance is afforded by the molecular motion within the lubricant. The resulting friction is confined entirely to the lubricant and is an exclusive function of the viscosity of the lubricant or the reciprocal, fluidity. Such conditions exist, for instance, in the case of bearings in which wearing and its consequences do not normally occur.

Maximum limit of total liquid lubrication is a direct function of lubricant's ability to withstand pressure. This type of lubrication exists up to a unit pressure of 4500 psi.

(2) Boundary lubrication exists between unit pressures of 4500 to about 450,000 psi. Deep drawing operations are performed at unit pressures of about 10,000 psi; ironing operations up to approximately 100,000 psi; wire drawing, tube drawing and cold extrusion of steel from 150,000 psi to 450,000 psi, approximately. Because the pressure range of boundary lubrication is so great, it may be helpful to refer to

Figs. 7 and 8—Dependence of coefficient of friction upon applied unit pressure is shown in these two graphs

Steel

the lubrication at the lower pressures within this range as semiliquid at the higher pressures as boundary.

Boundary lubrication is characterized by the incomplete separation of the sliding metal surfaces by an organic film. The amount of liquid film present depends on the unit pressure applied; the higher the unit pressure, the lower the amount of liquid film. Under the conditions of boundary lubrication it is evident that the viscosity of the lubricant is unimportant and need only be considered when using lower unit pressures. At higher unit pressures only a thin film of lubricant can exist, sometimes only a few molecules thick.

Types Of Lubricants—From the foregoing it can be seen that the other properties of the lubricant determine its usefulness, the two most important being "slipperiness" and film strength. A lubricant is said to possess slipperiness and film strength because of the lubricant's high degree of absorption, owing to its chemical structure. Good absorption is due to the presence of polar groups in the lubricant.

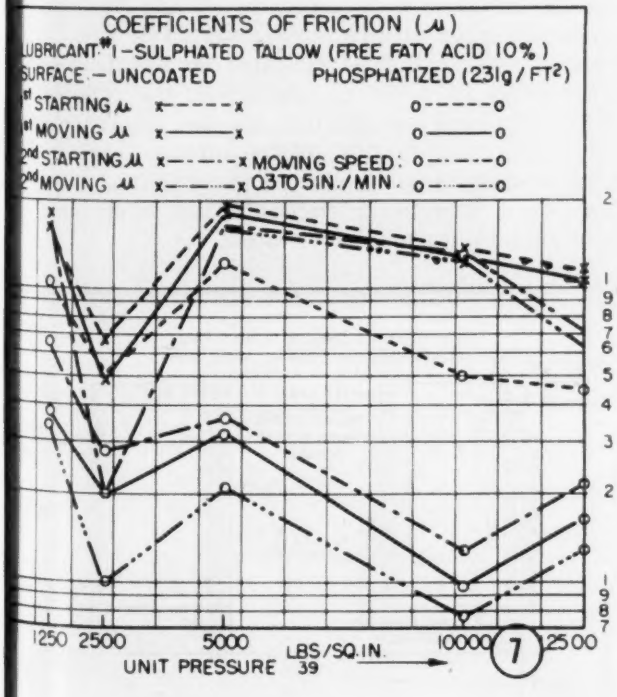
At higher unit pressures, the properties of slipperiness and film strength are not entirely effective against pick-up and galling by welding. Hence, at these higher pressures the inclusion of a pigment is often advantageous in that this inorganic inclusion tends to separate the sliding metal surfaces. However, inorganic pigments are resistant to only a certain degree against higher pressures.

A well interlocked coating, such as a phosphate coating, which may be looked upon as a fixed inorganic pigment, creates the best lubricating conditions by offering the greatest resistance against high unit pressures. This is one of the principal reasons phosphate coatings are so effective.

Transformation of Coating—A suitable phosphate coating, in many cases, may be reused up to a total reduction of about 80 to 85 per cent with the corresponding increase of the surface area. After an annealing operation the coating must be renewed. It is also found beneficial at times to renew the coating more frequently so that the die life may be increased and to insure prevention of pick-up during heavy working operations.

The coating loses its roughness as it is worked and becomes flatter and thinner. As the area increases the more "diluted" becomes the coating; it takes on the appearance of being amorphous and transparent, resembling a glass. The coating is less porous after working than before. Effectiveness of the coating is limited after working if about 20 to 30 per cent of the surface loses its coating, due to the increased surface area. Higher percentages of uncoated surface give an indication that the coating has been completely "used."

It is surprising to note that a phosphate coating, in spite of its brittleness, does not flake off as the


COEFFICIENTS OF FRICTION (μ)
LUBRICANT: 1-SULPHATED TALLOW (FREE FATY ACID 10%)
SURFACE — UNCOATED PHOSPHATIZED (23 lg/FT²)
1st STARTING μ x----x o----o
1st MOVING μ x——x o——o
2nd STARTING μ x—·—·—x MOVING SPEED: o—·—·—o
2nd MOVING μ x——x 0.3 TO 5 IN./MIN. o——o
2 1 .9 .8 .7 .6 .5 .4 3 2 1 .9 .8 .7
1250 2500 5000 10000 25000
LBS/SQ.IN.
UNIT PRESSURE 39
7

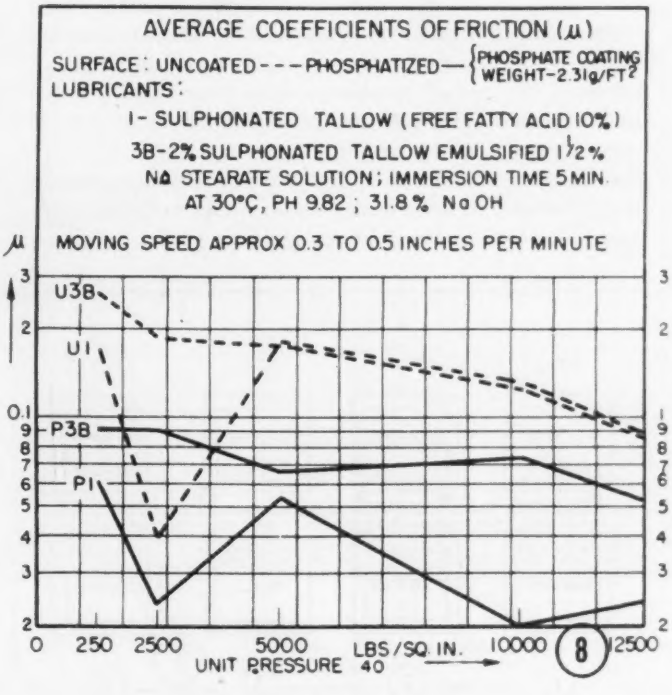

AVERAGE COEFFICIENTS OF FRICTION (μ)
SURFACE: UNCOATED - - - PHOSPHATIZED — {PHOSPHATE COATING WEIGHT-2.3 lg/FT²
LUBRICANTS:
1- SULPHONATED TALLOW (FREE FATTY ACID 10%)
3B-2% SULPHONATED TALLOW EMULSIFIED 1½%
Na STEARATE SOLUTION; IMMERSION TIME 5 MIN.
AT 30°C, PH 9.82; 31.8% Na OH
MOVING SPEED APPROX 0.3 TO 0.5 INCHES PER MINUTE
μ
U3B
U1
P3B
P1
3 2 .1 9 8 7 6 5 4 3 2
0 250 2500 5000 10000 12500
LBS/SQ.IN.
UNIT PRESSURE 40
8

TABLE II
COMPOSITIONS OF CONCENTRATED SOLUTIONS

	Make-up	Replenisher
Zn	183 ≠ 5g/l	188 ≠ 5g/l
P_2O_5	207 ≠ 5g/l	368 ≠ 5g/l
NO_3	230 ≠ 5g/l	160 ≠ 5g/l
Ni	5 ≠ 1g/l	5 ≠ 1g/l
Cu	.....	1.5 ≠ 0.3g/l
sp. gr. at 20° C	1.600	1.600

TABLE III
COMPOSITION OF 100 KG OF MAKE-UP SOLUTION AND 100 KG OF REPLENISHER

	Make-up	Replenisher
H_3PO_4 (75%)	29.6 kg	47.6 kg
HNO_3 (60%)	28.9 kg	19.3 kg
ZnO	16.8 kg	16.8 kg
$Ni(NO_3).6H_2O$	1.4 kg	1.4 kg
$Cu(NO_3).3H_2O$	.....	0.4 kg

TABLE IV
COMPOSITION OF AN OPERATING BATH

Zn	20 gms/l
P_2O_5	25 gms/l
NO_3	27 gms/l
Ni	0.1-0.2 gms/l
Cu	0.004-0.005 gms/l

surface area is increased. What occurs during cold working is not exactly known.

Optical and x-ray investigations have shown that during cold working, the relatively large crystals, owing to the high unit pressures applied, become smaller and smaller with a relative loss of orientation.

One of the most important advantages of a phosphate coating is its influence on friction which in turn results in many additional advantages.

Influence of Coatings—Tests were performed to show the influence of phosphate coatings in combination with various lubricants in a unit pressure range of 1250 to 12,500 psi. It is realized that this pressure range does not include those higher pressures which are customary for cold shaping and the coefficient perfection in the higher pressure ranges is generally higher. However, the results obtained are comparable to those which can be expected at higher unit pressures. Fig. 6 shows the friction testing device used. The test specimen was placed between the two highly polished jaws (which had a surface hardness of about 60 Rockwell C). By means of a screw and torque wrench the desired unit pressures were produced. Cold rolled mild steel, deep drawing auto body stock, having a tensile strength of approximately 45,000 psi was used as a test specimen. A tensile testing machine supplied the necessary moving load. Surface area for all tests was 4 square inches.

Both uncoated and coated test specimens were lubricated under exactly similar lubrication conditions and the coefficients of friction determined from both coated and uncoated specimens. The uncoated specimens were merely degreased before lubrication, whereas the coated specimens were degreased, pickled in a 10 per cent solution of sulphuric acid for 20 minutes at 160° F, and phosphatized in a 70-point solution for 5 minutes at 200° F. The average coating weight was 2.31 grams per square foot and the average loss of weight due to the pickling attack by phosphatizing solution was 0.0131 grams per square foot.

Lubricants were applied by dipping the test specimens and then removing and allowing to drain.

Figs. 7 and 8 show the dependence of the coefficient of friction upon the applied unit pressure.

Results of these tests may be summarized as follows:

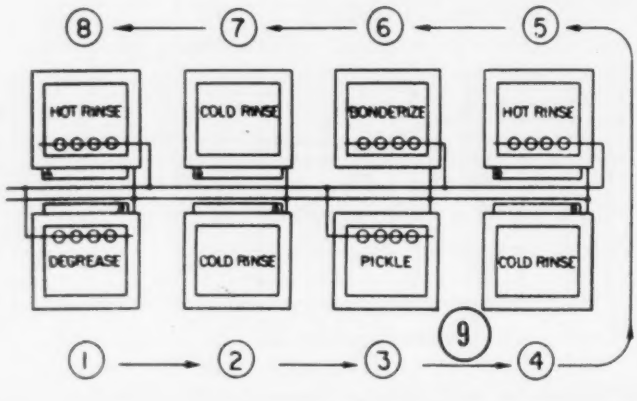
A phosphate coating causes a considerable decrease in the coefficient of friction.

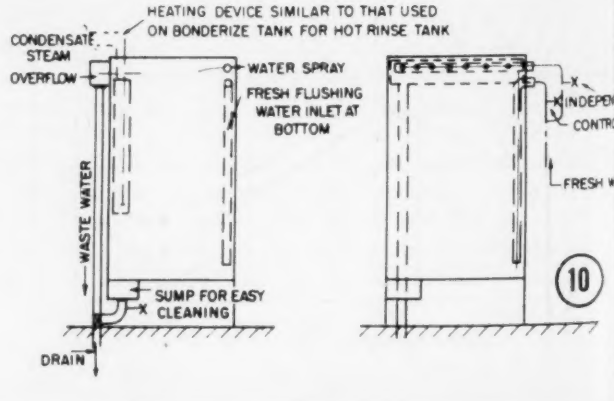
Considering the pressure range in liquid lubrication, the influence of the lubricant's viscosity on the coefficient of friction is easily seen. The higher the pressure the lower the viscosity (caused by the resulting heat) and the lower the coefficient of friction.

Change from liquid to boundary lubrication is evidenced by an increase in the coefficient of friction. The influence of viscosity on friction is especially marked, when viscose lubricants, such as sulphonated tallow (a paste), are used.

An additional decrease in the coefficient of friction is evident with the transformation of the coating, which is not the case with uncoated specimens. It follows, therefore, that in the use of a phosphate coating as a drawing aid, friction is not uniform while the material is being worked, since friction changes with the change in the coating. The best lubrication conditions are attained when the coating is transformed into its glass-like form.

Fig. 8 gives the average values of four coefficients of friction (starting and moving) using lubricant number one, both concentrated and "diluted" (emulsified in sodium stearate solution). The "diluted" lubricant was applied as indicated on the drawing. In the range of boundary lubrication, the "diluted" lubricant is just as effective as the concentrated form. It is evident that the diluted lubricant possesses an unchanging viscosity, which is about that of water. Therefore, a decrease in friction is not given under the conditions of liquid lubrication.





It is necessary to emphasize the fact that these tests do not show some of the effects on the coefficient of friction at higher pressures (e.g., cold extrusion). Therefore, it should prove interesting to investigate the effectiveness of phosphate coatings at higher pressures. However, these tests do show the importance of phosphate coatings and proper lubrication conditions as concerns friction.

Draw-Phosphatizing Applied to Cold Shaping Processes—For severe reduction of wall thickness with consequent increase in area, it is necessary to use thick phosphate coatings well interlocked with the metal surface. The coating weight should be between 1.5 and 4 grams per square foot. The solution should be based on the zinc phosphate and zinc nitrate content: In the operating solution the proportion between phosphoric acid (as P_2O_5) and nitric acid (as NO_3) should be 1:1. The compositions of the concentrated solutions necessary are shown in Table II. Table III indicates preparation of 100 kg of make-up solution and 100 kg of replenisher.

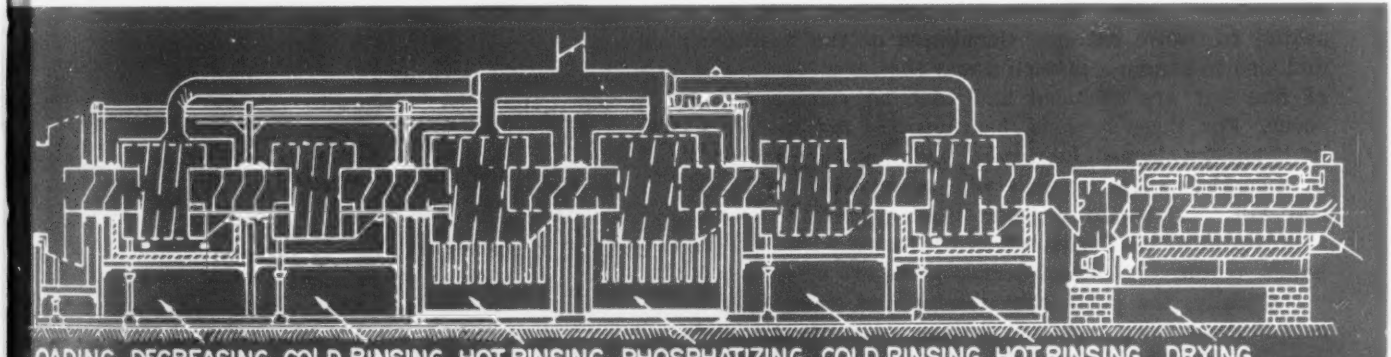
Composition of an operating bath is shown in Table IV. This is about a 70-point bath (number of cubic centimeters or "points" of 0.1 N NaOH necessary to neutralize 10 cc of the bath using phenophthalein). The ratio between free and total acid should be about 1:4-5 (free acid determined by titration using methyl orange). Because of chemical consumption, it is necessary to add replenishing solution from time to time. Temperature of the bath should be kept as near 200° F as possible. However, boiling should be avoided to prevent disturbance of the sludge.

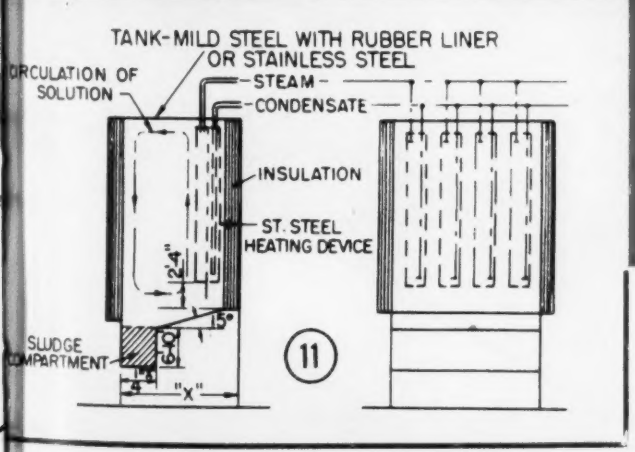
When the composition, concentration and temperature of the bath are all constant, then the immersion time determines the thickness of the coating. The usual immersion times are from about 1 to 7 minutes.

Chemical Treatment for Cold Shaping—The draw-phosphatizing process includes the necessary pretreatment to prepare the pieces for phosphatizing. The pieces must be absolutely free of any organic and inorganic impurities such as scale, rust, oil, fat, grease, etc. The pretreatment consists of degreasing, pickling and rinsing. Also included in the process is the after-treatment to prepare the phosphatized pieces for cold shaping, which consists of rinsing, drying and lubricating. A complete draw-phosphatizing line provides for degreasing, cold rinsing, pickling, cold rinsing, hot rinsing, phosphatizing, cold rinsing, hot rinsing, drying and lubricating.

A phosphatizing line was set up as shown in Fig. 9 to perform the actual work. Construction of the various tanks is shown in Figs. 10 and 11. Mild steel may be used for all rinse tanks. Stainless steel or mild steel lined with acid resistant material should be used for phosphatizing tanks. The heating element for the phosphatizing tanks must be stainless steel. When using hydrochloric acid, the tanks may be constructed of wood, ceramics or mild steel lined with acid resistant material. In the case of sulphuric acid, ceramics, lead, or acid resistant linings may be used. Lead coils should be used to heat sulphuric acid.

In Fig. 12, the equipment shown operates using rotating drums which automatically carry the work through the various solutions by means of a worm gear. Automatic loading and unloading make the machine completely automatic.





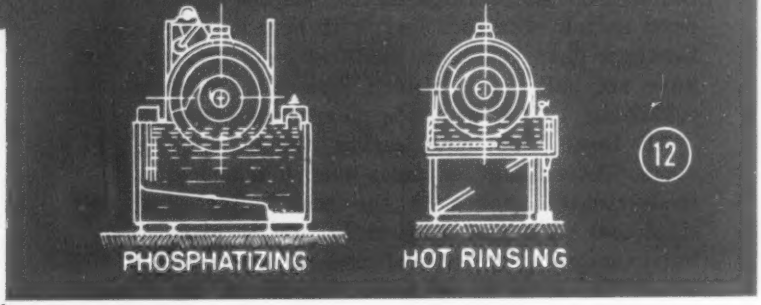


Fig. 9—Bonderize arrangement for cold extrusion
Fig. 10—Hot or cold rinse tank or alkaline degrease tank
Fig. 11—Typical bonderize tank
Fig. 12—Schematic sketch of automatic phosphatizing equipment

SCALE *Ball Bearin*

...require delicate processing an

Bearings used in scale manufacture are not touched by human hands, but are cleaned, lubricated, tested and assembled in a completely dustless room on stainless steel benches located in glass booths

DURING production of springless dial scales, the two pendulums that swing outward when load is applied are supported on shafts that turn in small ball bearings of a special type. No bearing of any type is completely frictionless but these bearings come as close to affording frictionless motion as is attainable commercially in sensitive scales of high capacity. To attain this condition it is essential not only to select the proper type of bearing but to make sure it is clean, properly lubricated and well protected. Every bearing must also be checked for friction and is rejected if this friction exceeds the exceedingly low maximum allowed.

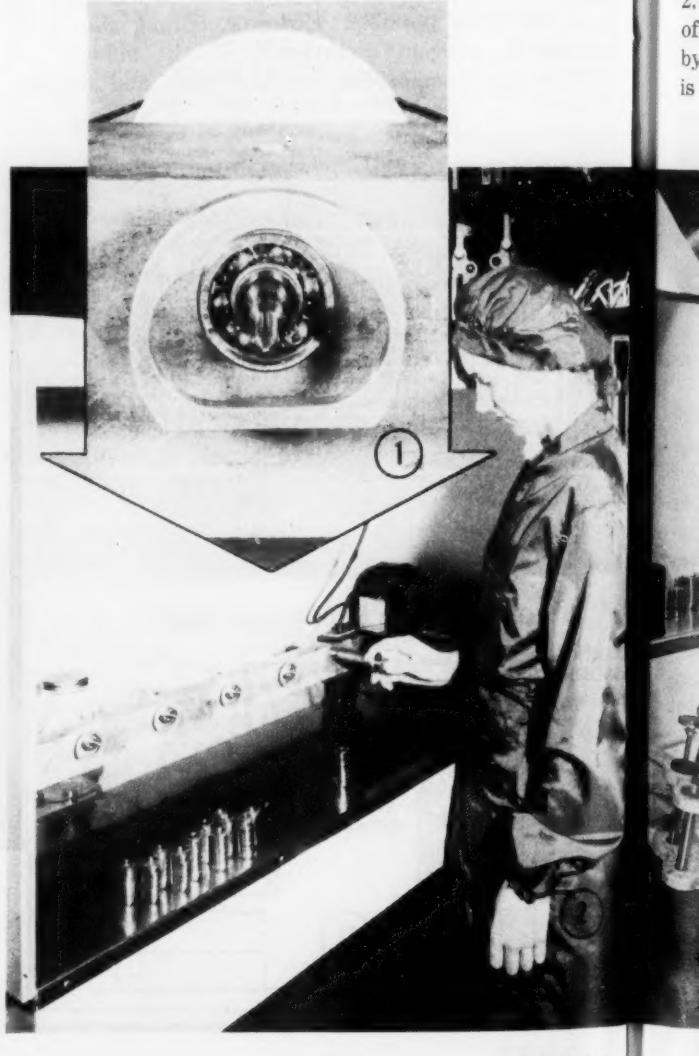
Since the slightest particle of foreign matter may cause more friction than can be tolerated, it is essential to insure extreme cleanliness of the bearing and also to handle it in such a way that even particles of fine lint are excluded and that no rusting can occur. For these reasons, bearings are not touched by hand, are cleaned, lubricated, tested and assembled in a dustless room by girls who wear nylon smocks and caps and perform the respective operations on stainless steel benches in glass booths in which only hands, required tools and needed parts are permitted.

Naturally, the parts that receive and enclose the ball bearings also have to be cleaned with greatest care, as do the tools used, but attention here is centered on the bearings, as they are the most critical parts as far as factors dealt with here are concerned. Bearings have retainers, modified deep grooves, and have six balls of 9/64-inch diameter. The bore is 0.2362-inch and the outside diamter is 0.7480-inch.

All Dust Excluded—Bearing size is sufficient to avoid "Brinnelling" of races even if a shock load is inadvertently applied to the scale. Races are so sized that balls have a looser fit than in conventional bearings and cannot bind under any condition to which the scale is subjected. Bearings are placed in closed recesses with caps that barely clear the shafts; the weighing mechanism is in a sealed case so that dust is effectively excluded from bearings in service.

Ball bearings are carefully processed by the makers, of course, and are received in waxed paper wrappings. Waxed containers are delivered to the test room which receives only filtered air and is kept under slight pressure so that all leakage of air is outward. Walls, ceiling and floor of the room are painted to avoid any particles from them entering glass booths previously mentioned.

As bearings are removed from waxed containers, they are placed without being touched by hand in glass stoppered jars containing chemically pure benzol which is strictly moisture free. The benzol dissolves any grease on the bearing and washes off any foreign matter. From this solution, they are then removed with a metal holder or spring collet that lightly grips the outer race.



By O. S. CARLISS
Chief Engineer of Scale Dept.
Philadelphia Division
Yale & Towne Mfg. Co.
Philadelphia

ASSEMBLIES

and handling

One Drop of Oil Used—To dry the bearing, it is held in a jet of warmed air that has been passed through silica gel and a water trap and over an electric heating element. Heating the air prevents any dewing. Further washing is done with an atomized spray of Eng-Sol, a special chlorinated hydrocarbon made especially for this purpose. Next, one drop of instrument oil is applied to the balls with a hypodermic needle and is distributed over balls and races by causing the bearing to rotate in the warm air jet. Then the bearing is placed in a washed transparent plastic vial that holds a set of six bearings and the vial is capped. All these operations are performed in a glass booth.

Next, the vial is transferred to another booth, Fig. 2, and each of the six bearings is slipped over one of six spindles which are driven at the rate of 3 rpm by wire belt. The block that is carrying the spindles is supported on rubber and the driving motor, also rubber mounted, is on the floor, only the vertical belt joining the two. This arrangement precludes any sensible vibration reaching the spindles. The motor is reversible and spindles are rotated first in one direction and then in the other.

Friction Test Described—Only load placed on the bearings is that of a light aluminum washer having a D-shape, Fig. 1. At the center of the curved portion of this washer is an arc that fits the outer bearing race. Weight and dimensions of the washer and its eccentricity are such that, if friction exceeds 0.0002-inch per pound, the washer will rock off the central arc and assume another position, which instantly shows the operator that bearing friction is excessive. Bearings so indicated are rewashed and retested. Any that on retest, again show excessive friction are rejected and returned to the supplier.

Bearings that pass this sensitive test are returned to the plastic vial which is covered and transferred to the glass booth where they are assembled into the weighing mechanism, Fig. 3. Bearings are a slip-fit in seats. In all cases, the bearing is handled by the special tool so that no skin excretions or other foreign matter will be deposited on its surface. After recess caps are in place and shafts that support the pendulums are assembled, the bearings are well enclosed and need not be touched. The scale mechanism of which the bearings are a part undergoes careful weighing tests before being released for inclusion in the final scale assembly, which is again tested throughout the scale range before release for shipment.

Fig. 1—In checking for friction, this D-shape aluminum washer is set on the bearing in the position shown. If friction exceeds the maximum specified, the washer rocks out of the central and bearing is then rejected

Fig. 2—Machine in which a single ball bearing is mounted on each of six spindles that rotate at 3 rpm to indicate if friction is below the specified maximum. The driving motor shown inside the booth is located an the floor and drives the machine by a vertical belt

Fig. 3—After bearings have been cleaned, lubricated and checked, they are inserted into bearing recesses in the scale frame by use of the collet holder shown

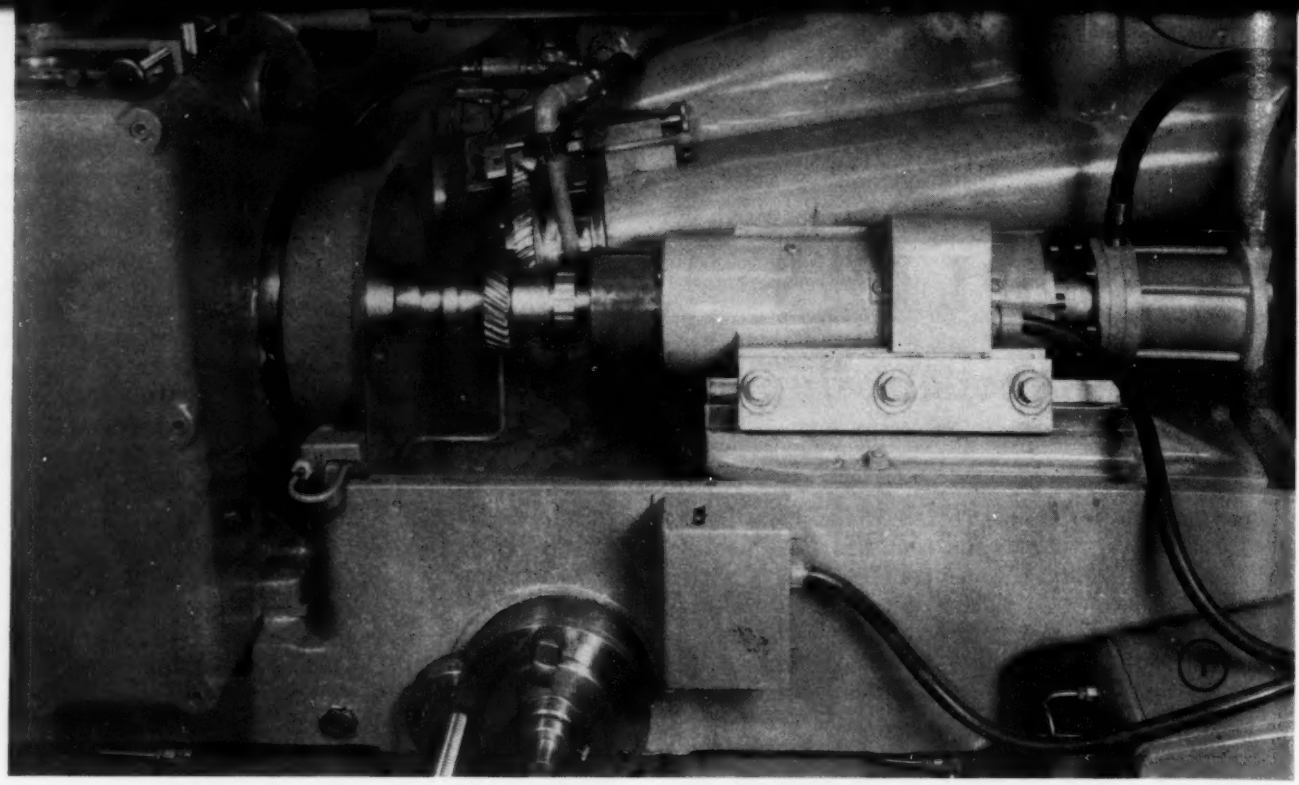


Fig. 1 — Setup of cutter and work for finishing an external helical gear, showing quick-acting pneumatic fixture

TOOTH FINISHING

. . . with modified gear shaper cutters

Helicoidal type cutting teeth, set at an angle to the work, remove metal in the form of fine chips and bring either spur or helical gears to a high degree of accuracy

By GUY HUBBARD
Machine Tool Editor, STEEL

SINCE the late E. R. Fellows—in 1896—invented his method of cutting gears on a production basis by means of reciprocating gear-shaped cutters, he and his associates at Fellows Gear Shaper Co., Springfield, Vt., have been responsible for the discovery of many other uses for the machines and the method.

For example, by the use of cutters contoured to shapes other than of gear teeth, it has been possible to apply the shaping principle to the cutting of splines, cams and various irregular forms, both internal and external. The standard cutters also have been applied successfully to the generation of worms—in this case by "rolling" them parallel to the axis of the work, thus allowing their teeth to act as thread generating tools.

At the time of the recent co-operative machine tool show held by the machine tool builders of Springfield and Windsor, Vt., the highlight of the Fellows exhibit was another new application of the gear shaper cutter, this time as a gear finishing or "shaving" medium. While this involves the use of an entirely new machine, the cutters used both on spur and helical gear finishing are merely slightly modified versions of standard gear shaper cutters.

As shown by Fig. 1, the new machine is of horizontal instead of vertical type and the cutter is set at a slight angle to the work instead of parallel to it. The cutters, illustrated in Fig. 2, have teeth of helicoidal shape and are sharpened by a simple process of face grinding. (*Please turn to Page* 106)

Fig. 2—Gear finisher cutter on left is for a helical gear; that on right is for a spur gear. Note that sharpening is by face grinding only

Fig. 3—Collections of chips removed by finishing cutter indicating free cutting action

TEMPERATURE CONTROLLED SHOPS: Air conditioning which indirectly has been responsible for no small amount of business for the machine tool builders and will make a lot more, shows unmistakable signs of penetrating that industry as a "working tool".

Back in the days when "thousandths" served to express the ultimate limits of accuracy on machines of recognized quality, the changes in length and diameter brought about by ordinary variations in temperature were of little or no concern. As limits tightened, however, it was found desirable to shade or paint skylights and window walls in order to keep direct sunlight off beds and other large, highly finished components. It also was found desirable to finish lead screws in cool basement rooms.

Then came accurate thread grinding to long lengths, with which made the appearance of refrigerating units to keep the cutting oil at uniform temperature. The same technique also began to be applied to long shaft work including the lead screws already mentioned.

This summer of 1949 has been a "scorcher" throughout the machine tool building areas of this country. As a result I have found myself getting an increasing amount of satisfaction out of visits to machine tool plants which have humidity and temperature controlled departments.

Not long ago I spent a pleasant interlude in the "cool room" at Bryant Chucking Grinder Co., Springfield, Vt., wherein precision ball bearing slides and spindles are assembled. More recently I spent an even longer interlude in the big "cool room" at the Pratt & Whitney plant in West Hartford, Conn., wherein their gage work—some of it equalling small machine tools in size—is done. Those are two of many places where I have encountered this kind of thing, and I find more of them every time I make a swing around the machine tool circuit.

Aside from the exact control of dimensions in the process of manufacturing and assembling precision gages and mechanisms, attained through temperature control, there undoubtedly is much benefit attained through improved physical comfort and mental stability of the skilled workers. "Sweat and tears" have no place in the task of scraping the bed of a supermicrometer. By the same token, do they have any place in the task of scraping in the bed of a precision lathe?

The story of improved working conditions in the machine tool industry is a long and interesting one. To its many chapters it may not be long before one can be added on temperature control as a factor in improving products and industrial relations.

BIG MACHINE TOOLS: Behind every builder of extremely large mechanical equipment stands some machine tool builder who has designed and built some machine large enough to machine the largest components of the mechanical equipment in question. The big machine tools which make possible the building of other big things are apt to be either planers, horizontal boring machines or a relative of theirs.

The machine that I now have in mind combines some of the features of both. It is a huge "planer-type" horizontal boring, drilling and milling machine.

SEEN AND HEARD IN THE *Machinery Field*

By GUY HUBBARD
Machine Tool Editor

It was created for the benefit of Hydraulic Press Mfg. Co., Mt. Gilead, O., by G. A. Gray Co. of Cincinnati. It was shown and described to me by those justly proud brothers, Henry and August Marx, respectively president and vice president of G. A. Gray Co., in whose plant the preview took place on Thursday and Friday, July 21 and 22, 1949.

Achievements such as this by the G. A. Gray organization have tremendous influence on our life and our economy here in the United States. However, the typical man-in-the-street—who in the end profits by them—has little or no knowledge or appreciation of them. Between them and him lie two, three and sometimes four "industrial middle men", the only one of which he has much if any knowledge is the dealer who sells him such consumer goods as an electric refrigerator or an automobile.

Take, for example, the probable industrial history of this huge Gray planer-type boring, drilling and milling machine. The average man never has heard of G. A. Gray, in all probability he never has heard of Gray's customer, Hydraulic Press Mfg. Co., but he is aware that the XYZ Automobile Co. is bringing out a new model whose exotic and roomy body intrigues him greatly.

He credits the XYZ organization with this achievement. Little does he know about the headaches of the tool shops who had the body die problems dumped in their laps; the headaches of the pressed metal experts who turned to the company in Mt. Gilead, O., for bigger and bigger presses; the trials and tribulations of the press builders in Mt. Gilead in translating their designs into finished metal units; and finally the unprecidental designing and machine tool building adventures of the G. A. Gray people in finally rounding out this co-operative industrial effort to give the man-in-the-street a better, a more beautiful and—we hope—a cheaper automobile.

Other than to mention that the new G. A. Gray machine weighs 175 tons and will cost in the neighborhood of a quarter of a million dollars, I will not describe it in detail here. That will be done later in an engineering article. The point that I am trying to make is that in organizations such as the G. A. Gray Co., America has industrial assets which deserve far wider appreciation than they have had.

Ordinary machine tools make more goods for more people. That's mass production. Extraordinary machine tools make the machines which in turn make more goods for more people. That's basic!

FUNDAMENTALS OF STEELMAKING

NUMBER **10** OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

PRODUCTION OF TIN

Two methods of applying a tin coating to steel are in use today. First and oldest is a hot dip process introduced in this country in 1873 and most recent is the electrolytic process whereby tin is electroplated on both surfaces of a steel sheet

PART I

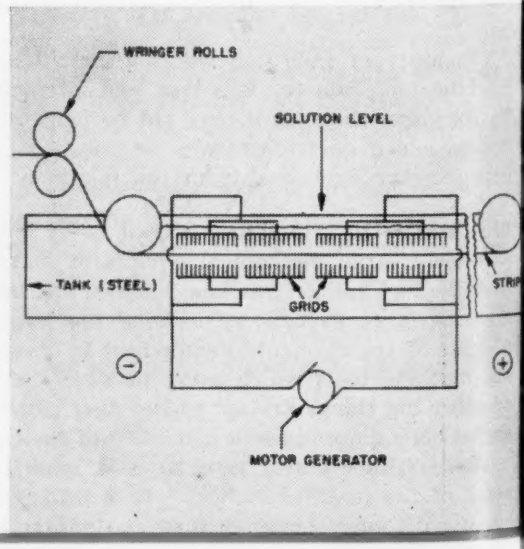
TIN PLATE is produced by coating both sides of thin sheets of ordinary low carbon steel with a very fine layer of tin. Two distinctly different methods of applying this coating are in use today. First and oldest method is the hot dip process which was introduced into this country in 1873. Second is the electrolytic process whereby a tin coating is electro plated on both surfaces of a steel sheet. This method came into being within the past ten years and its development was given great impetus by the recent war.

Tin plate is ordinarily made and sold in this country in gage thicknesses running from 0.008 to 0.0145-inch. Coils of steel which are to be made into tin plate are first cold rolled down to these gages on a tandem cold reduction mill, and weigh as much as 30,000 pounds depending upon the particular mill's shop practice. The rolling medium used in cold reduction, either straight palm oil or an oil emulsion, is detrimental to good tinning practice and must be removed from surface of the strip. Coils must therefore be put through an alkali cleaning operation after cold reduction. This is carried out at running speeds up to 2500 feet per minute. The coil is placed in a rotating coil holder, or uncoiler which secures it firmly and permits its unwinding. The front end or beginning of the coil is welded by means of a lap welder to the tail end of the preceding coil, thus making for a continuous band or ribbon of steel speeding through the cleaning line, as the succession of units in the cleaning process is called. Strip is then deflected down by a roll, over which it passes, into a pre-dip tank containing a hot alkali solution of from 2 to 3 ounces per gallon concentration.

Upon emerging from this tank, it passes through a scrubbing unit which cleans both top and bottom sides of the band by means of brushes rotating at a speed of 3000 revolutions per minute against the passing strip. These brushes, about 12 inches in diameter, are usually composed of tampico bristles and are adjustable for the purpose of alignment and taking up wear. Sprays of hot alkali solution are applied at the brushes to aid in the cleansing action. The band then passes into an electrolytic cleaning tank where final removal of rolling oils and other surface contamination is accomplished by electrolytic action in a hot alkali solution (190 to 200° F) of between 2 and 3 ounces per gallon concentration.

This tank is about 60 feet long, 4 feet wide and 3 feet deep. At each end of this tank there is a 24-inch diameter steel dunking roll under which strip passes and is thereby kept submerged. Between these two dunking rolls, are located eight sets of grids, all in line and spaced about 3 feet apart, Fig. 1. Each set consists of a top and a bottom grid about 6 inches apart, the strip passing between them. Each grid is about 48 inches long and is built up of 1½ x ¼ x 42-inch long bars on edge and spaced about 1 inch apart. The first four sets of grids are connected to one 3000 amperes, 16 volt generator while the last 4 grids are connected to another similar generator, thus making two electrical groupings. In each grouping the first two sets of grids are kept positive and the second two sets of grids are kept negative. In its travel through this electrolytic cleaning tank, the band therefore passes between two sets of grids which are positive, then between two sets which are negative, then between two more sets which are positive, and finally between the last two sets of grids which are negative. The alkali solution which forms the electrolyte, and the steel band complete the electrical circuit in each grouping. Electrolyte level must at all times cover the top grids which are generally about 18 inches from the tank bottom.

Upon emerging from the electrolytic tank, the band passes through another scrubbing unit similar to the one located after the pre-dip tank. Here,



By ALFRED E. KADELL
Manager, Tin Plate Dept.
Weirton Steel Co.
Weirton, W. Va.

PLATE

however, high pressure water sprays are used to wash away loosened matter on both band surfaces. It then passes through a washing unit where it is cleaned and sprayed with hot water after which it is dried thoroughly as it travels through a hot air blast drier. Strip now enters a set of pinch rolls which furnish motive power in the line up to this point, since they are motor driven, and consequently, pull the strip through all units described above. The band is therefore under tension up to this point in the line as a result of back pull generated electrically in the uncoiler by forward pull of the pinch rolls on the strip.

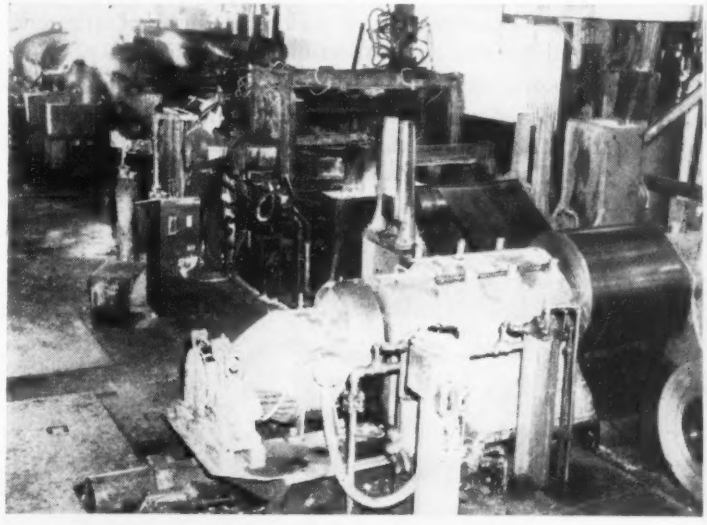
Upon leaving the pinch rolls, the band enters a pit about 15 feet deep where a loop is thereby formed ahead of the next piece of equipment which is called the drag unit. Last unit in the line is a reel which winds the band up again into the form of a coil. The drag unit consists of two 20-inch diameter horizontal rubber covered rolls arranged in parallel one above the other and spaced about ½-inch apart, and a 10-inch diameter fiber roll parallel with and resting against the top roll, with controlled pressure applied to it. Material passes between the fiber roll and top roll and partially around the latter. It then comes down tangentially to the bottom roll which it leaves in a similar manner to go to the reel. Thus passage of the strip through this unit is in a path shaped like the letter "S". Function of this drag unit is to furnish back pull against the reel, so that the band is always under controlled tension between them, thereby permitting proper coil winding. Rotating guides called fin mashers, at the entry side of the drag unit, aid in straight winding of the coil.

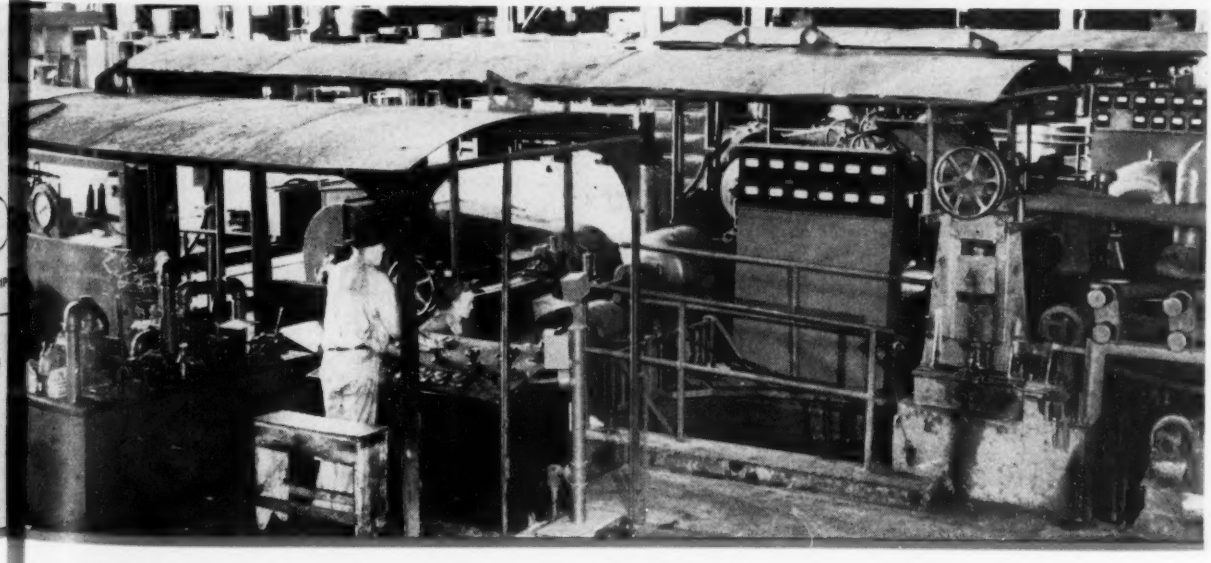
The reel consists of three segments on a shaft which are expanded at the start of a coil so that they form a cylinder around which the coil is wound. A belt wrapper, moved forward and back electrically, is brought up to the reel so that the belt is in contact with slightly more than the lower half of the

Fig. 1 (left below)—Schematic view of electrolytic cleaner showing one electrical grouping

Fig. 2 (right)—Entry end of cleaning line, showing from right to left, uncoiler, deflector roll, trip shear, welder and pre-dip tank, with electrolytic cleaning tank at extreme upper left. Coil at extreme lower right is ready to be placed in uncoiler

Fig. 3 (below)—Exit end of cleaning line, showing hot air drier at extreme right followed by pinch rolls, looping pit and drag unit beside which workman is standing. Operator of line is standing at control desk with recoiling reel shown at his left. Coil at extreme left is being weighed on scales





expanded reel's circumference. Entering band is thus guided around the reel for several turns and then the belt wrapper is withdrawn, while the reel continues to wind up the strip. When the coil being wound reaches full size, the line is stopped, the band is cut by a workman with a pair of hand shears, and the reel is collapsed. A stripper plate at the reel's drive end, hydraulically operated, pushes the coil off the reel. Coil now passes over a scale where it is weighed, and then moves, by way of a conveyor, to a turn-over which rotates it 90 degrees thereby turning it over flat on its side.

Maximum size of coil made at the cleaning line is determined entirely by capacities of the equipment employed in subsequent operations, and runs as high as 30,000 pounds in some mills.

Steel at this point in the process is very hard and brittle because of severe cold reduction it had undergone prior to cleaning, and will not withstand any forming or stamping operations. After cleaning, therefore, coils are put through an annealing process to render material suitably soft and ductile for future fabrication into containers. Steel cleaning prior to annealing is a prime requisite in the process of making tin plate. If coils were to be annealed without previous removal of the oil left on from cold reduction, a carbon film and stains would be produced on the steel surface which would be highly detrimental to subsequent application of a tin coating.

Cleaned coils, now turned over flat on their sides, are picked up by a crane, with the aid of a lifting mechanism constructed like a pair of tongs, and placed on the annealing base. This is a large shallow brick lined rectangular steel pan containing from one

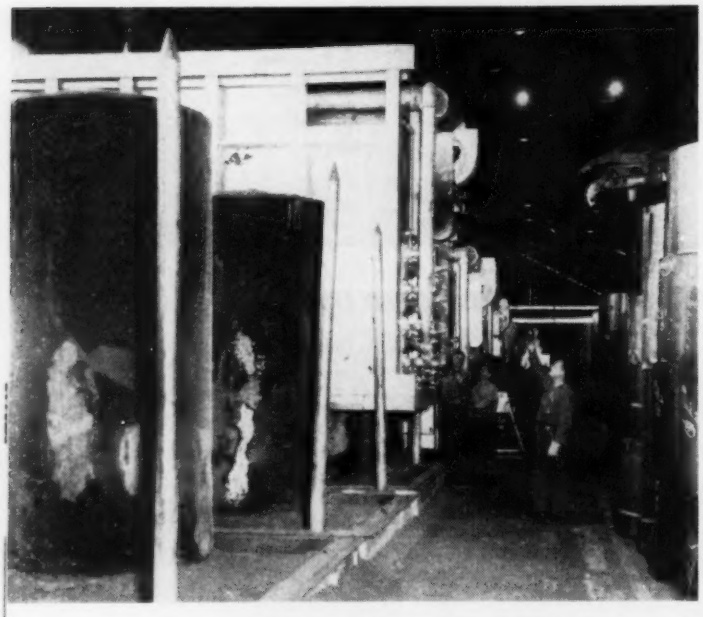


Fig. 4—Portable radiant tube annealing furnace being set down on base by crane. Annealing bases shown at left contain annealed coils that are cooling. Cylindrical "inner covers" are removed when coils under them have cooled sufficiently. Coils are then stacked on storage floor. Note sand piled up at base of inner covers. Tongs hanging from crane are used to handle coils

The author, A. E. Kadell, received an A.B. degree from Columbia University in 1921 and the degree of metallurgical engineer from the same university in 1925. In the fall of 1925, he joined the metallurgical department of Weirton Steel Co. as assistant to the chief metallurgist, and about 3 years later was moved up to assistant chief metallurgist. In 1929 he entered the operating end of the business as foreman in the tin plate division, and in 1930 became assistant manager of that division. In the fall of 1936, he moved to the Steubenville plant of Weirton Steel Co. as manager and remained in that capacity until the beginning of 1944, when he was appointed manager of the tin plate division at Weirton, the position he holds at the present time.

to two rows of circular pedestals each about 12 inches high. Pedestal diameter is generally equal to the outside diameter of a standard size coil which, as explained previously, is established for each tin mill by its particular shop practice. In the center of the pedestal, there is a circular opening whose diameter corresponds to the inside diameter of the coil. This, obviously, is determined by the expanded diameter of the cleaning line reel. In this circular opening in the pedestal, a fan is located. Generally there are four pedestals in a row, number of rows being determined by the particular furnace design which varies somewhat with each mill, although basic annealing methods and practices are quite uniform throughout the industry. Two rows of pedestals are the most in use at the present time.

Cleaned coils are stacked on pedestals up to as many as five high, depending on furnace design. A cylindrical steel cover called an "inner cover" is then placed over each stack of coils so that the bottom of this cover rests in a circular grove in the brick lining of the base. Clean dry sand is then placed around the bottom of each cover to act as a seal. Natural gas or desulphurized coke oven gas is introduced and kept flowing under slight pressure into the cover during the full firing and cooling periods of the annealing cycle to prevent formation of oxides on the steel surface being processed. This is known as deoxidizing. Recently, nitrogen gas containing small percentages of carbon monoxide and hydrogen has also come into some use for this purpose. Function of the pedestal fan is to circulate "deoxidizing gas", as it is called in the industry, within the cover during the process.

When all pedestals on the base have been stacked with coils and the inner covers placed over them, the "portable furnace" is set down over the entire charge by a crane so that it rests solidly in a fixed position on the base. This "portable furnace", which supplies heat necessary to anneal the charge, consists essentially of a large steel brick lined box with an open bottom. To the inside of the two walls which run parallel with the rows of pedestals on the base,

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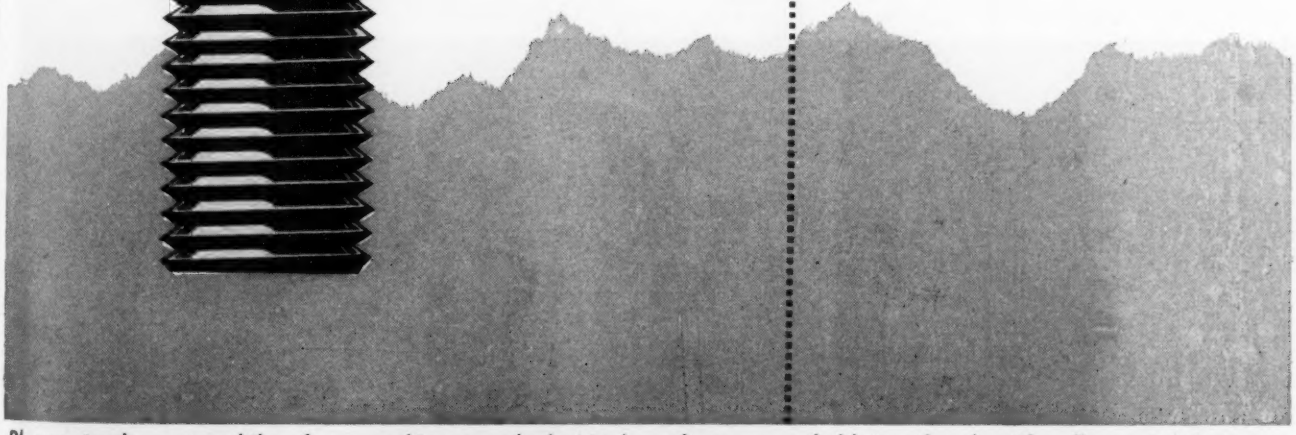

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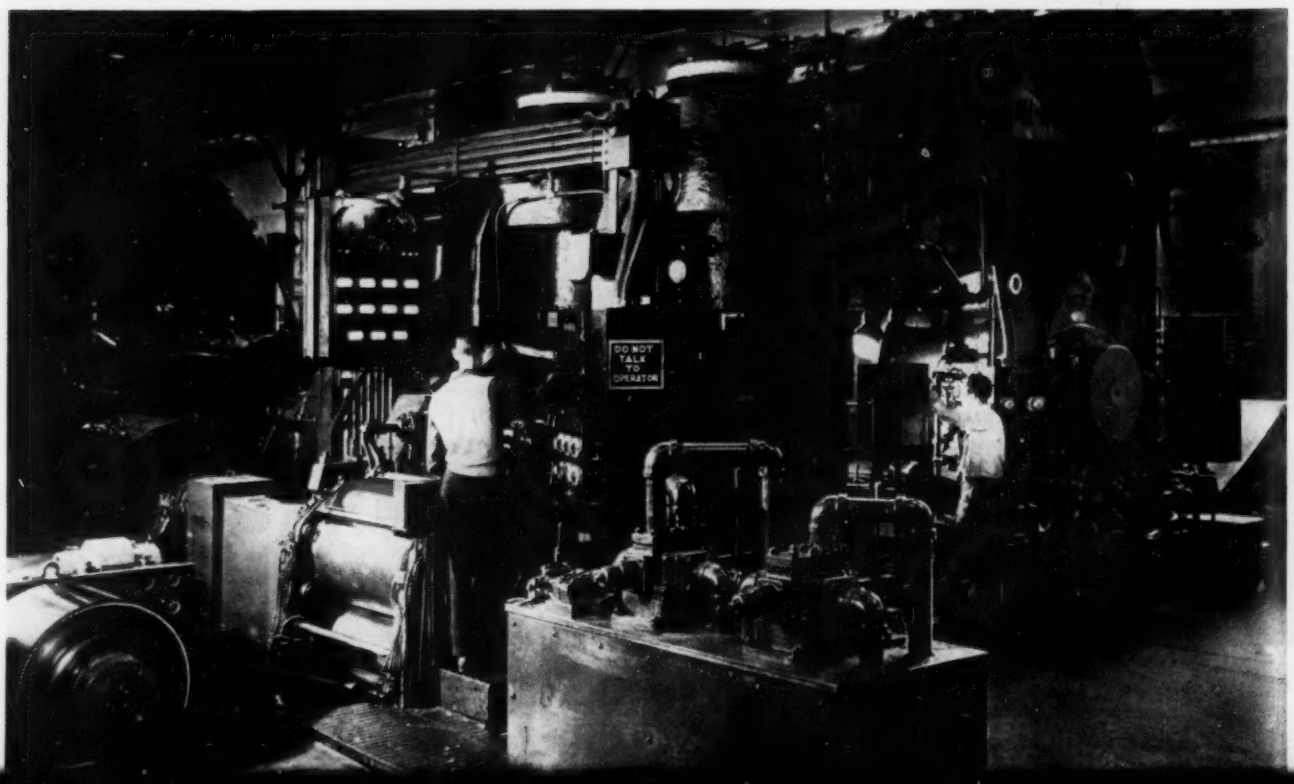
there are fastened horizontal alloy heat resistant U-shaped tubes with both legs of the U running the full length of the furnace wall so that both open ends of the tube come through to the outside of the furnace end wall. Into the open end of one leg, a burner, fastened to the outside of the end wall, injects a mixture of gas and blower air that burns in the tube, exhaust gases leaving by way of the open end of the other leg of the tube which is connected to a flute. Combustion of gas in the tubes brings them to a bright red heat, between 1600 and 1700° F, and they in turn radiate their heat to coil stacks located about a foot away. This type of annealing furnace is called the radiant tube unit. Number of tubes located on each wall will vary from two to five depending upon furnace design, height of the coil stacks being the determining factor. Where there are two rows of pedestals on a base there is also a row of radiant tubes in the center of the furnace between both rows of pedestals. Thus at all times each stack of coils is heated from two opposite sides.

Thermocouples are located in each furnace and base, and a charted record is made, by means of recording instruments, of furnace and steel temperatures throughout the firing cycle. Furnace temperature at peak is generally between 1450 and 1500° F. The steel is usually brought to a temperature of about 1200° F and soaked for several hours. Upon completion of the heating cycle, the furnace is picked up by crane and moved to another base which has been previously loaded with coils and is ready for firing. The base, from which the furnace has just been removed, is then allowed to stand undisturbed until the steel has cooled down to a temperature under 300° F when inner covers are taken off and coils removed by crane to the stock floor. Heating time generally consumes between 30 and 34 hours, while the cooling cycle runs from 48 to 50 hours. Therefore, three bases are generally required for each furnace, the latest designed having capacity to fire a charge of about 300 tons.

The coils now are bright and silvery in appearance, and, after having cooled down to room temperature, are transferred to the temper rolling mills. In the annealed state steel is very soft. It must be given some cold reduction to render it suitable for forming into can bodies without paneling or to stand a drawing operation without showing strain lines. Required cold reduction is obtained by cold rolling annealed coils on temper mills in the dry state, that is, no oil rolling medium is used here as on the tandem cold reduction mill. Amount of cold reduction will vary from 1 to about 5 per cent depending on degree of stiffness required in the steel for making the particular part successfully.

A typical temper mill has two four-high roll stands in tandem, spaced at 12 foot centers, with a tension regulator between them. One roll stand is the master mill and maintains the running speed set by the mill operator. Speed of the other roll stand is regulated electrically by the tension regulator so that tension in the band is constantly maintained at the setting made by the operator. Each roll stand contains a pair of 42-inch diameter back-up rolls. Between them is placed a pair of 18-inch diameter motor driven work rolls. Back-up rolls turn by frictional contact with the work rolls. All rolls are approximately 42 inches in length of body. Pressure between rolls is furnished by a motor driven screw-down on each side of the roll stand, and is applied to the top back-up roll necks. Both screw-downs move up and down in unison. At the temper mill entry end there is an uncoiler similar to the one used on cleaning lines, followed by a tension unit. At the exit end there is another tension unit followed by a reel. Both tension units

Fig. 5—Typical temper rolling mill showing roll stands, uncoiler at extreme right, and winding reel at extreme left with stripper plate behind coil being wound. Operator is leaning on tension unit to right of reel. Tension regulator is directly in front of man standing between roll stands. Meters located at left of operator's head indicate power consumption on various units and tensions applied to the band



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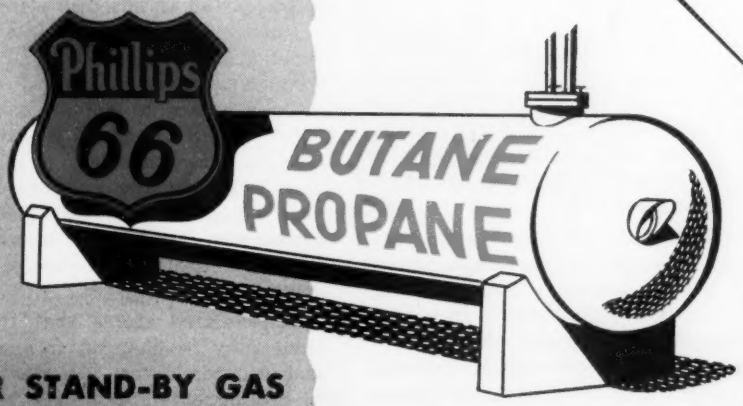

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are similar in design to the drag unit used on a cleaning line, except that the rolls are made of very hard, highly polished steel.

As the coil unwinds at the uncoiler, it passes through the entry tension unit and into the nip of the work rolls in the first roll stand. Uncoiler and tension unit supply tension to the band by furnishing back pull. After leaving the first roll stand, material passes over the tension regulating roll, which is about 5 inches in diameter and 42 inches long, and then passes through between the work rolls in the second roll stand. Its path of travel now takes it through the exit tension unit, and thence to the take-up reel where it is coiled. The exit tension unit aids in maintaining desired tension in the band between the reel and second roll stand. Required amount of cold reduction is obtained by applying the proper amount of pressure on the rolls by the screw downs. The band is kept under tension throughout. This prevents it from twisting and pinching in the rolls and maintains its straight line of travel through the mill, thereby guaranteeing good winding on the reel. Amount of tension applied by the mill operator varies with band width and gage. Rolling speeds as high as 4000 feet per minute are used.

Other temper mill functions, in addition to mild cold reduction, are to make the steel flat, and impart a smooth glossy finish to the surface of the band. Steel flatness is essential to the fabricator to permit him to produce a good product, and maintain a high degree of efficiency in his operations. A smooth bright surface is most necessary for subsequent tinning operation.

(To be continued)

Unusual Attachment

Expands Uses of Riveters

ALTHOUGH a standard riveter is suited for punching and coin-dimpling light materials, the standard practice in the aircraft industry is to punch and coin-dimple only materials whose combined thickness does not exceed approximately 0.080-inch. The Consolidated Vultee Aircraft Corp., San Diego, Calif., found, in view of the present trend toward high-speed planes with heavy skins, that their riveters would be limited for use in countersink riveting operations without an attachment.

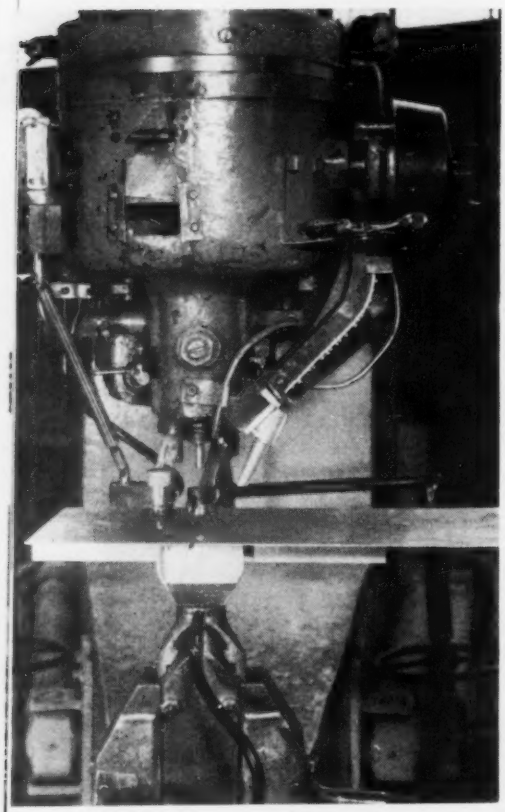
Standard riveters have been converted to drill, countersink and riveting machines in a few hours, the company states, the conversion consisting of installing a ¼-inch air line from each of the two shift cylinders to the main cylinder, a ⅜-inch air line from the main air supply to the main cylinder, and a 5/16-inch air line from the control valve to the cylinder. These air lines were connected to the motor bracket to operate the air blast for chip removal, the piston which starts the air motor, the air motor itself and the stripper pressure booster.

The second conversion step consisted of removing the main piston and plunger assembly and replacing the standard sliding piston stop with a special hinged piston stop to provide a greater differential between the drill and rivet stroke's piston travel. The rivet stroke ends in the conventional manner with the fiber piston thrust block resting on the bottom of the cylinder, but in the drill and countersink stroke, the piston is held up by a sufficient distance to compensate for the thickness of the drilling gear box and drill.

Punch Prevents Shifting—Disconnecting the punch lift rod and replacing the standard punch lift extension with one which is spring-loaded to hold the punch above the stripper and anvil post was the third conversion step. Upon piercing the material, the tip of the drill depresses the spring-loaded punch until the bottom of the stroke is reached, at which time the microswitch terminates the stroke and the drill rises, the spring loaded punch following it up into the hole. This prevents the material from shifting before the conventional rivet stroke has been completed.

Final step was the mounting of the motor bracket, motor, torque tube, gear box, special valve stop with which to control the downward speed of the piston on the drill stroke, and a pop-off valve which facilitates the rapid change of stripper pressures from approximately 30 psi on the drilling stroke to approximately 60 psi on the riveting stroke. Prior to operating the machine, it is necessary to adjust the micrometer stop ring, which is graduated in 0.001-inch increments, and the microswitch which controls the change from drilling to riveting.

Consolidated states that the machine may be changed from drilling and countersinking for flush rivets to drilling only for brazier heads or flat heads by merely unscrewing the micrometer countersink stop ring and microswitch actuating screw so that the countersink does not engage the material. It is said that changing of top-set, gear box adapter, rivet shoe and rivets can be accomplished in a few minutes. The only limits as to the thickness of material which can be drilled and riveted by means of this new attachment are determined by the length of the countersink drill and the clearance between the end of the drill and the material.



Setup which permits drilling and countersinking with a standard automatic riveting machine. It consists of drive motor mounted on left side of head, drive shaft and gear box which carries drill and countersink unit

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VITAL properties of toughness and resiliency of oil rig Kelly rods are imparted by scientifically controlled processes centering around alternate heating, forging and close inspection techniques at the Torrance, Calif., plant of National Supply Co. A "Kelly" is the metal link that picks up the driving power of an oil rig's engines and transmits it, rotary-wise, to the string of drill pipe working down into the earth. Since this piece of equipment is always in motion, and various strains upon it are developed by the mile or more of drilling string, it generally bears an increasing variety of stresses and strains as the drilling job progresses. Its strength, therefore, must be built in—principally through forging.

Like every major steel product, the Kelly has its beginnings in a melting furnace charge. At Torrance, electric melting furnaces are utilized. Alloys are added to the selected scrap, and laboratory samples made during the heat to insure strict metallurgical control. Steel is poured into ingots and delivered to the forging shop while still at cherry-red heat.

Heating the Ingot—The ingot is heated to a temperature of approximately 2250° F, after which it receives its first forging; it is squeezed into a square billet and allowed to cool slowly in a sand bed. This cooling removes a quantity of hydrogen gas from the billet, preserving the desired molecular pattern of the forged steel. To make certain maximum hydrogen gas exodus does take place, the billet is reheated to 1250°F, and then allowed to cool to 600°. At this time, the billet surfaces are checked for surface defects that might interfere with further processing.

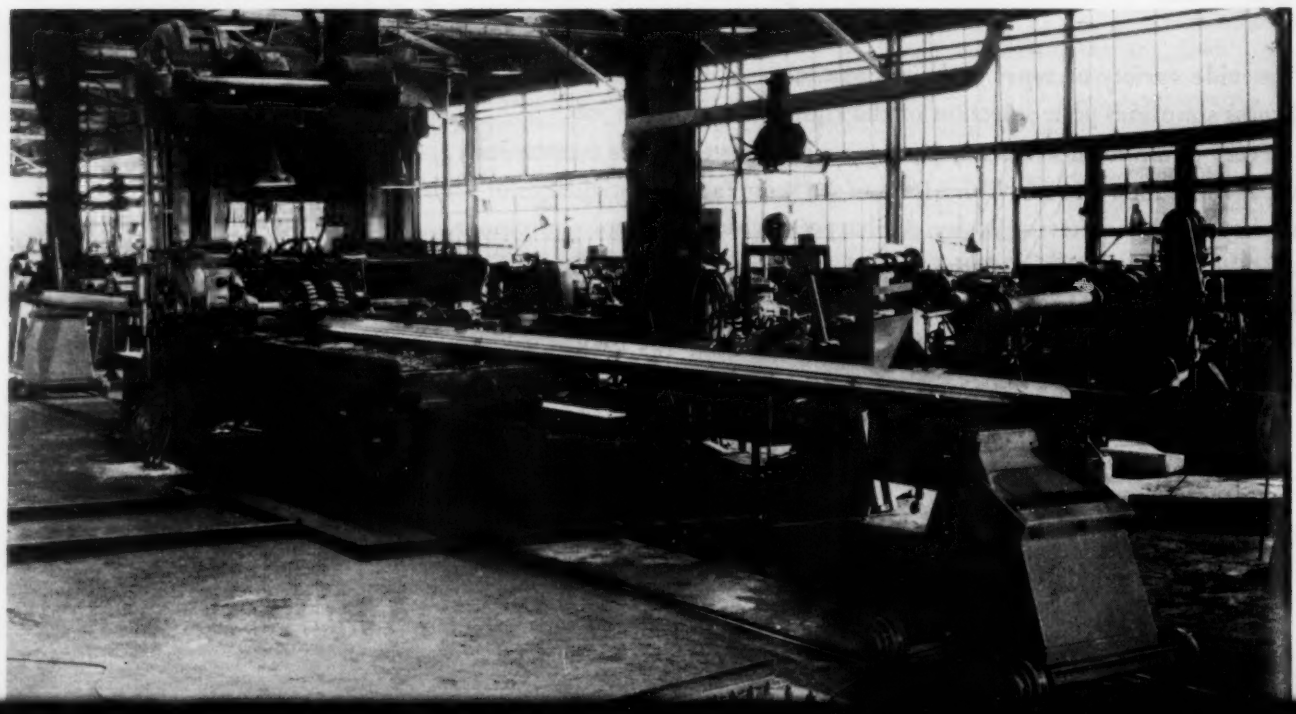
Once more, heat is applied to the billet as its temperature is raised to 2250° F. Five per cent of the billet (taken from the lower end of the billet which was, at one time, the base of the ingot) is removed so that no defective crop end material can work into the final forging. Then the press begins hammering the center of the billet, bringing the metal down to a square of approximately the same diameter of the round required. The stock is forged round by working the corners in subsequent passes to avoid lapping. The billet may be removed for reheating several times during this stage of operations. Bottom and top of the billet are forged to size, and the forging allowed to cool before machining.

Cropped Before Forging—A factor in the field stamina of the link is in the fact that both top and bottom ends of the billet are cropped before final forging, so that only a uniform steel, practically guaranteed against internal weakness, will constitute the end product. Before machining, specimens of the bar are tested and checked, and then, at the engine lathes, ¾-inch of rough outside diameter stock is removed, and the driving section of the Kelly is turned to within plus or minus 0.005-inch of the specified size. To prepare for the next operation—boring the water hole—a pilot hole is begun in each end of the bar so that the boring tools may enter them properly. Again the piece must pass an inspection test.

In drilling the water hole, the work piece is revolved while simultaneous drilling proceeds from both ends of the bar to minimize runout, with the drills operated in counter direction to the rotating Kelly. Then, two more tests follow, as a 10-foot long bar only ⅛-inch less than the diameter of the water hole is passed through the water hole to check for straightness; and a concentricity test is also made. To accomplish this, the piece is revolved while an observer sights through a telescope placed at one end of the bar, and focuses on a lighted target set at the other end of the bar. Rigid tolerance is the only rule here—and maximum allowable eccentricity cannot exceed 0.00625-inch per foot of length.

Machining—The part is next re-

This milling operaton, during which the Kelly receives its characteristic hexagonal surfaces, does not begin until the long bar has received a battery of tests to check straightness and uniformity of surface. Water hole, whose entrance is visible at the near end of the bar, was drilled out in an earlier operation



turned to the machine shop, where it receives its characteristic hexagonal surfaces that will eventually be gripped by a rotary machine in the field. Threading follows, with each joint cut to a standard gage and inspected for accuracy. Still another alignment test is made.

Earlier in the processing, the original billet ends were cropped to remove possible impurities. Now, in the nearly finished product, a magnetic check of the joint ends is made to make certain no surface cracks are present.

If it has passed through this production cycle without reject, the unit is nearly ready for oil field service. It receives a series of identification markings on its exterior by drilling, milling and stamping. Joint ends of the Kelly are sometimes copper-plated for added rust prevention in the field as well as to allow for easy joint makeups. Stem of the piece is always given a coat of rust preventive, while round ends are painted with so-called "national blue." Threaded joints receive a coat of plastic strip compound.

Worm Gear Jacks Solve Flame Beveling Problem

Problem of flame beveling tank sheets preparatory to welding, formerly a laborious and costly operation which had to be executed with much care for good results, has been solved by application of worm gear jacks and traversing bases. Previously, the machine was mounted on a stationary frame and the tank was raised or lowered to accommodate the height of the frame. Engineers of Duff-Norton Mfg. Co., Pittsburgh, in studying the operation, realized that a more desirable method would be to make the beveling machine frame vertically mobile.

It was found that by mounting the flame bevel machine on a frame controlled by three vertically-positioned worm gear jacks, the bevel machine could be raised quickly or lowered to the desired level. The operation is not only easier but much more exact, it is reported. Additional vertical adjustment is made possible by two traversing bases at either end of the tank.

Hanchett Grinder Line Bought by Mattison

Line of grinders made by Mattison Machine Works, Rockford, Ill., is being supplemented by the line of production grinding machinery formerly made by Hanchett Mfg. Co., Big Rapids, Mich. Purchase of this line of machinery will supplement the machinery made by Mattison.

Recently acquired Hanchett machines include: Vertical spindle—rotary type; vertical spindle—rotary automatics; vertical spindle—reciprocating type; hydraulic traveling table and traveling wheel grinders; single, double, vertical disk grinders; and automatic single disk grinders.

Die-Cast Aluminum Automobile Door

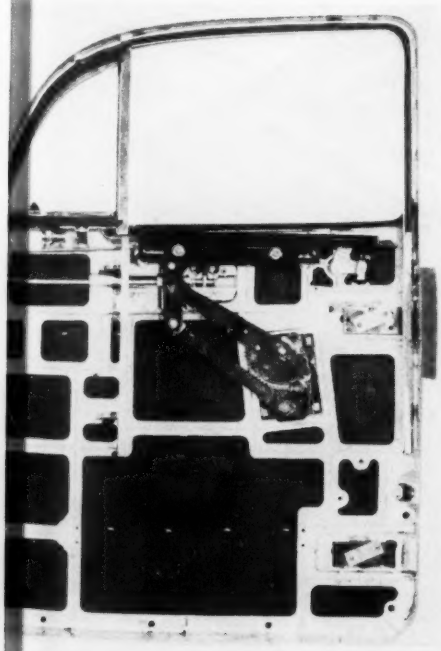
. . . expected to cut assembly costs

A DIE-CAST aluminum automobile door, said to be the largest die casting in area ever produced, is now in production at Doehler-Jarvis Corp.'s Toledo, O., plant. The 1200-square inch unit forms the structural base for the door, to which the sheet steel outer panel is attached. Designed in collaboration with Kaiser-Frazer Corp. engineers, the door is the result of nearly 2 years' concentrated effort on the part of design, die and metallurgical personnel.

Weighing slightly more than 12 pounds when trimmed, the casting enables free use of reinforcing ribs. Frames will conform to shape and free the final door from annoying variations. It is anticipated that time lost in hand fitting doors will be eliminated, resulting in substantial savings in assembly costs.

In addition to its lightness, the special aluminum used in the door is corrosion-resistant without special treatment, is free from dimensional changes and retains all original properties at subnormal temperatures.

Die used to produce the door weighs approximately 13 tons and the trimming die weighs more than 4 tons. Molten aluminum alloy is "shot" into the steel die in less than 1/5-second.



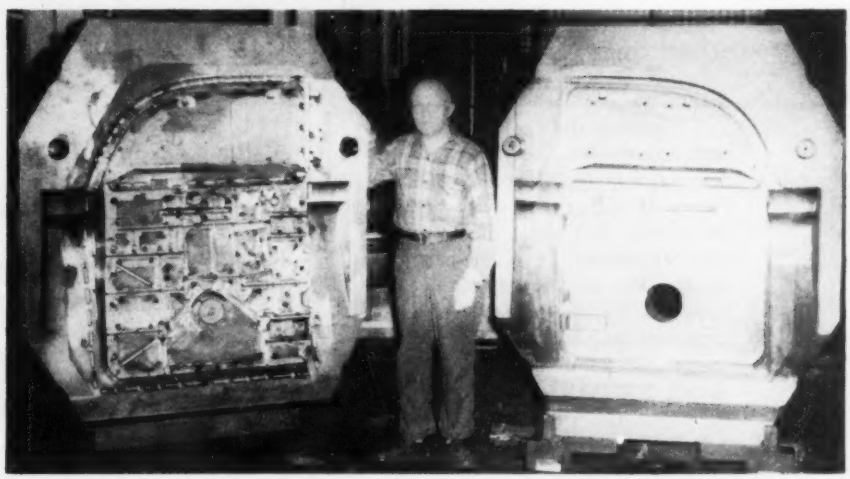
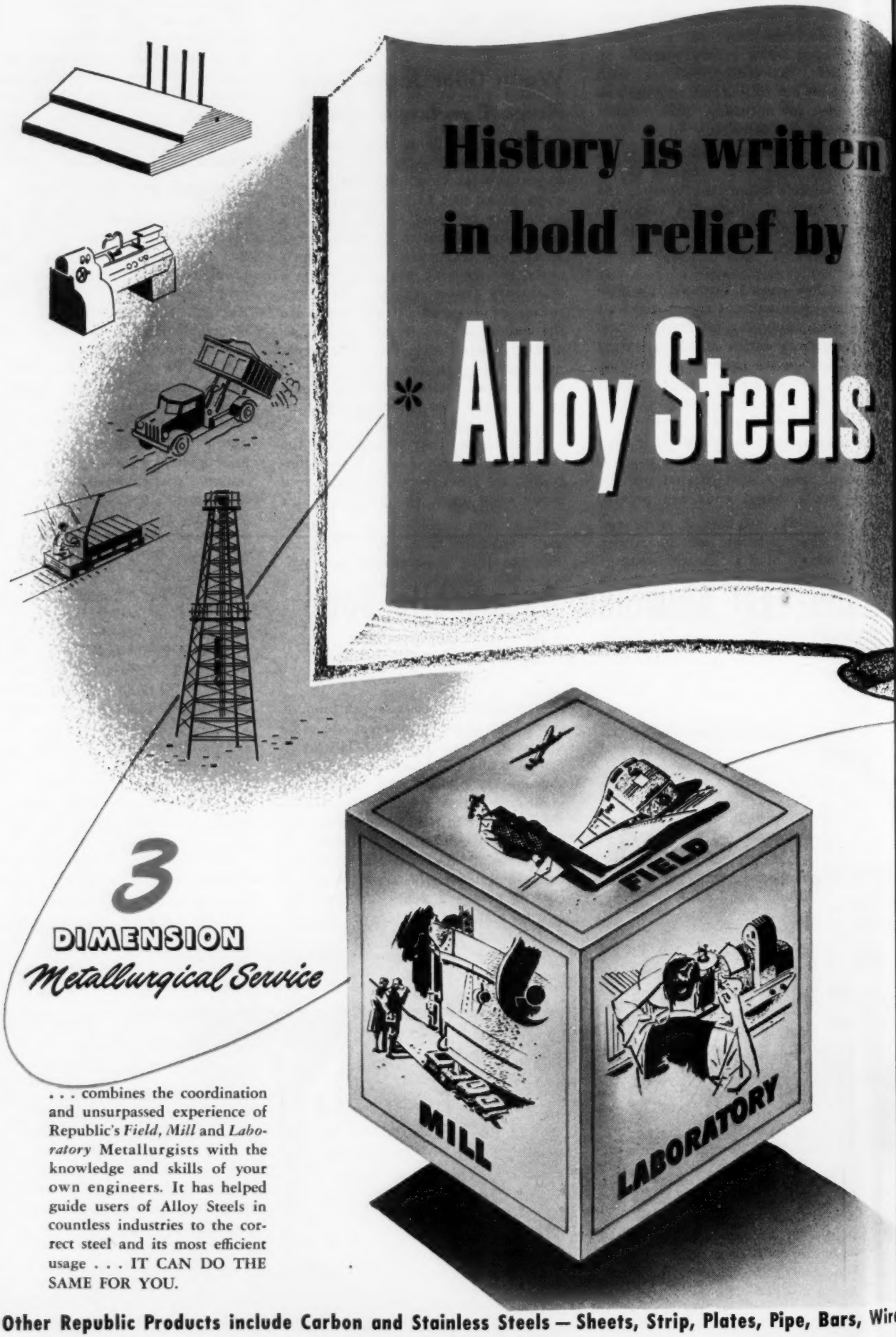


Fig. 1 (above) — Completed Kaiser-Frazer automobile door, minus interior trim, showing how die cast aluminum frame provides for mechanical fittings Fig. 2 (right)—Die used in casting door frame weighs over 13 tons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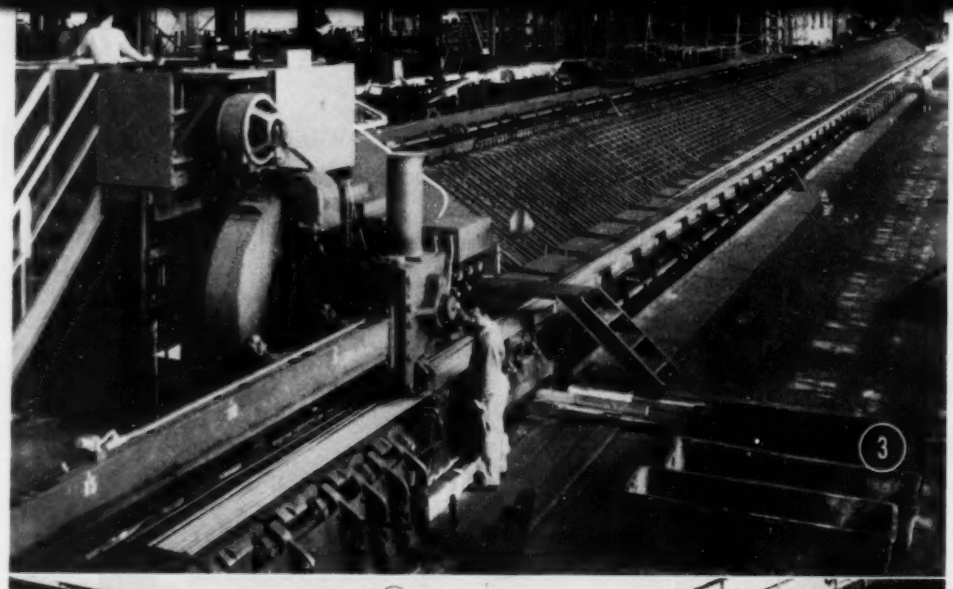


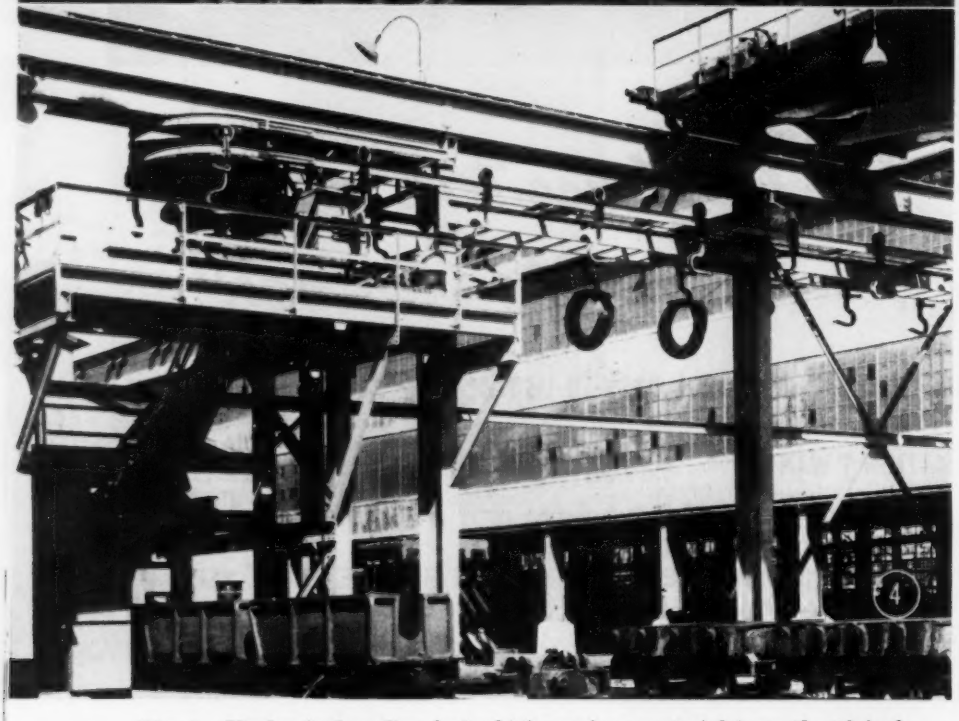


Fig. 3—Mechanical cooling bed which receives material from the 10-inch bar and rod mill

Fig. 4—Coils being conveyed to string of narrow-gage cars spotted beneath chute

six rod finishing stands (No. 15-20 incl.).

The dimensions and power requirements of the stands are as follows:

Stand No.	Motor hp	—Roll Dimensions— Diam., in.	Body, in.
0 & 1	250/300		
2	250/300	16	86
3	250/300		
4 to 8	1040/1250	14	32
9 & 10	334/500	12	28
11 & 12	334/500		
13	233/350	12	24
14	233/350		
15 to 20	834/1250	10	20½

Three vertical edging stands are provided, one between stands Nos. 2 and 3, driven by a 125/150 hp motor, one between stands Nos. 8 and 9, driven by a 100/150 hp motor; and one between stands Nos. 11 and 12, driven by a 67/100 hp motor.

Three repeaters are available for automatic looping of rod and merchant bar sections. The first two of these are of the 180-degree type, and are located ahead of stands Nos. 13 and 14. The third, following stand No. 14, is of the forward running type.

Wire rod will be produced double-strand and delivered to four laying-type reels. For maximum output the last finishing stand operates at a speed of approximately 4000 fpm.

The smaller sizes of reinforcing bars, ⅝-inch and under, are likewise rolled double-strand and are delivered in straight lengths to the cooling bed.

All merchant sections are finished on No. 14 stand at delivery speeds ranging from 700 to 1500 fpm. These sections are all delivered to the cooling bed, except for certain special sections, such as nut flats and bolt rounds, which may be delivered to two pouring-type reels.

Billets come in 30-foot lengths, and 2½ and 4-inch squares. They are produced on a 32-inch reversing blooming and a 22-inch 3-high billet mill, which also supply the billets for the adjacent 12-inch bar mill.

The 2-high reversing blooming mill with 45-foot manipulator tables and a manipulator on the entry side, rolls 17 x 17 x 74-inch ingots, weighing approximately 5000 pounds each. It has a hot bed equipped with a rapid transfer, by means of which billets may be taken directly over to the billet-heating furnace of the 10-inch mill without any delay and charged hot into the furnace. An up-and-down-cut shear has a capacity of 108 sq in. (hot). The rated capacity of the blooming mill exceeds 50 tons of 4 x 4 inch billets per hour.

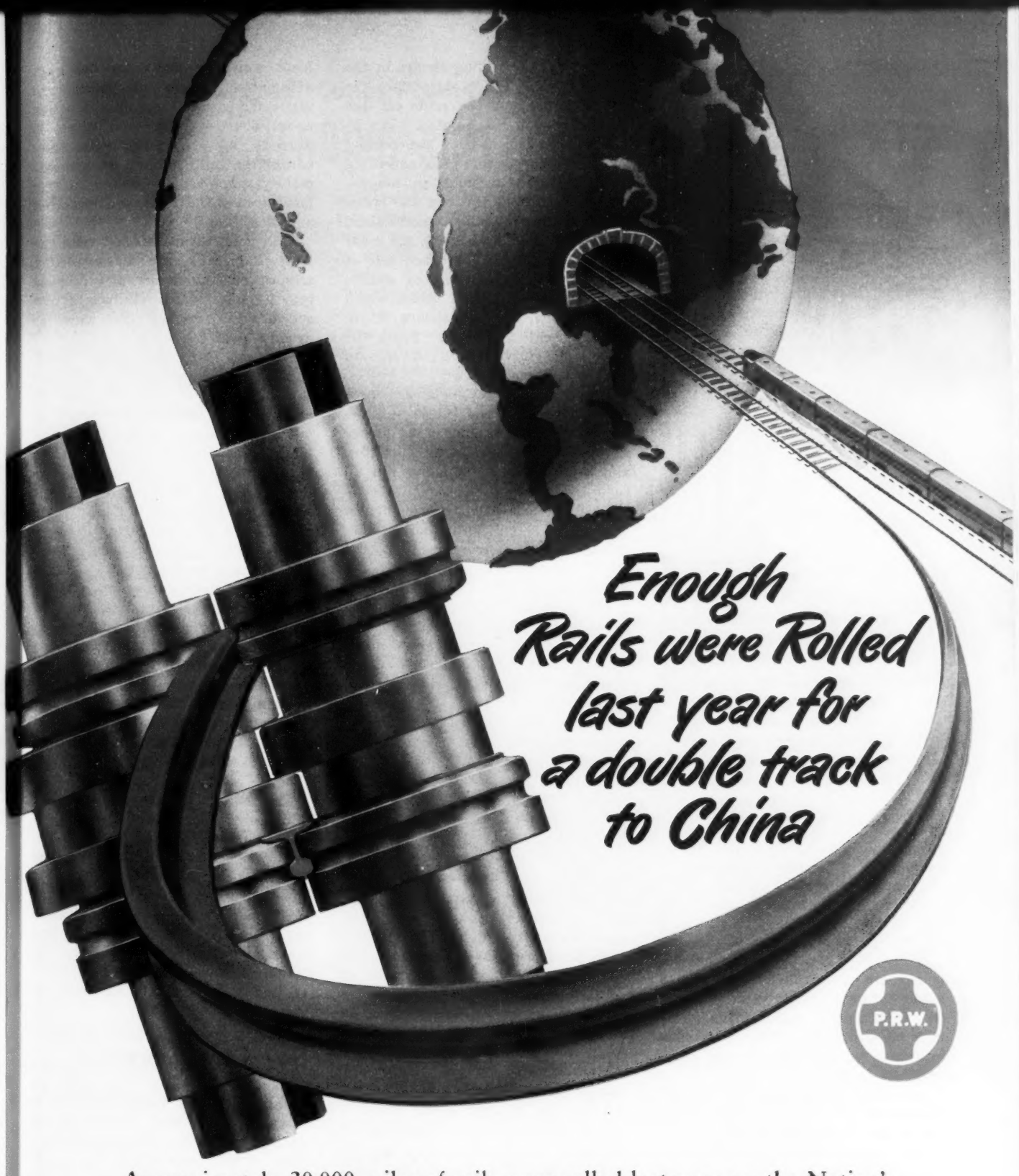
Part of the output from the bloomer, however, is broken down further on a 22-inch, 3-high billet mill with tilting tables, shear, and hot saw. This mill discharges either to a hot bed which delivers the billets to the roller table feeding the billet-heating furnace of the 10-inch mill or directly to the 12-inch mill furnace. Some of the billets may first be sent to scarfing beds if surface preparation is required.

The billet-heating furnace in the 10-inch mill is of the side charge, side discharge type, and has an effective heating area of 32 x 45 feet. The hearth is horizontal at the point of discharge, but slopes 1½ inches per foot from the charging end to a point 4 feet from the centerline of the discharging door.

The furnace is divided into a primary and a secondary heating zone. Both zones are designed for top firing and both are equipped with 14 burners. By this method of firing, the furnace can be operated efficiently at varying temperatures. Full advantage also may be taken of the maximum flame temperature available in the primary heating zone, and excessive scaling is avoided whether the furnace is operated at high or at low capacity. When heating billets 30 feet long the furnace has a normal capacity of 40 tons per hour.

Bunker C fuel oil or natural gas is burned, with a fuel consumption of approximately 1,250,000 Btu per ton of steel heated. The furnace is equipped with automatic control of temperature, air-fuel ratio and pressure.

For 2-strand rolling a mechanically-operated switch plate enters the heated billets selectively into either



Approximately 30,000 miles of rails were rolled last year on the Nation's rail mills. A substantial portion of this rail "mileage" traveled through mills using Phoenix rolls.

Phoenix "A" Rail Roughers, Phoenix Metal Rail Intermediates and Phoenix Special Rail Finishing rolls are well known throughout the steel industry for their ability to produce high tonnages of rails rolled to close tolerances to meet the most exacting requirements — all at less cost per ton of steel rolled.

PITTSBURGH ROLLS Division of Blaw-Knox Company, Pittsburgh 1, Pa.

PITTSBURGH ROLLS

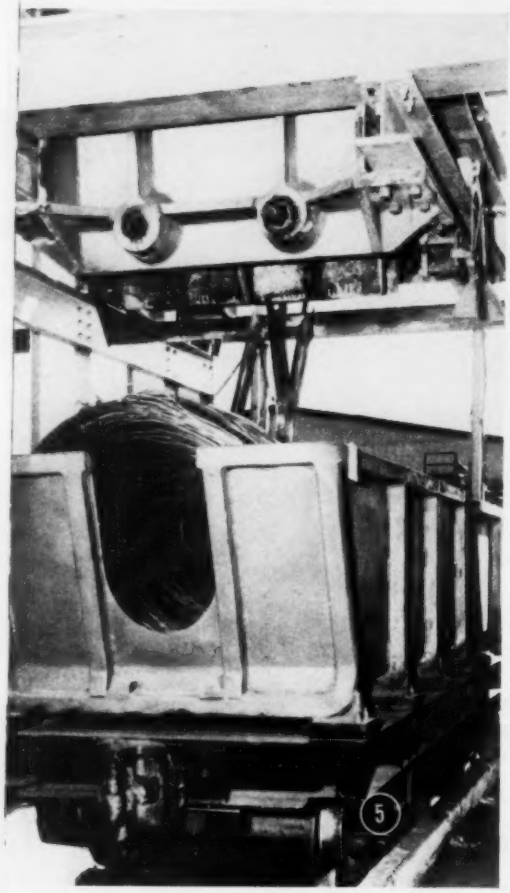


Fig. 5—Narrow-gage car spotted beneath chute receives coils from conveyor

of the passes in the first stand, with minimum loss of time between bars. A manually-operated toggle shear, capable of severing hot billets up to 2½ inches square, and arranged for either single or double strand operation, is mounted on the entering side of the first roll housing.

A flying shear operating on 80-pound air is installed after No. 8 stand, for use in selective cropping of the front end of bars. This shear may be moved out of the line when merchant sections not requiring cropping are rolled.

All controls for the mill are arranged in a 10 x 25 foot pulpit facing the intermediate stands.

Two solenoid-operated emergency snap shears are installed in the repeater connecting stands Nos. 13 and 14, for use when a cobble occurs in the finishing train. These are operated by pushbutton controls located in the main pulpit, at No. 14 stand, and at the finishing stands.

The major part of the mill output is delivered to a 360-foot double cooling bed, connected to the mill by a 170-foot hot runout table with individually driven rollers. Two rotary disk-type dividing shears in the runout table, synchronized to the delivery speed of the mill, cut the bars into hot-bed lengths.

The first 240 feet of the cooling bed is equipped for pack-annealing flats. To prevent snags in the delivery of bars to the bed the speed of the hot runout table is maintained well above that of the mill, the maximum being 2300 fpm. Each side of the bed discharges through shuffle bars to the cold runout tables which deliver them to cold shears where they are cut to length. From the shears the cut bars are delivered to cradles and scales.

Four laying-type reels are provided for coiling rod. These are designed to produce coils of 34 inches inside and 46 inches outside diameter, and are capable of handling rod up to ⅜-inch diameter, producing coils of 600 pounds. They are driven through a single 30-hp, adjustable-speed motor, synchronized to the stand from which the rod is delivered.

The stripped coils are transferred horizontally from the reels to a 180-foot chain conveyor, by interlocking, motor-driven pusher arms, electrically interlocked with the conveyor.

The rod is delivered to the reels by means of specially designed connecting pipes. A set of spray nozzles and water eliminators is provided in each delivery pipe, for controlling the temperature of the rods before they enter the reels, to minimize grain growth and to reduce scale formation on the surface.

Two merchant-type pouring reels are provided for coiling certain sections such as nut flats, bolt stock and other sections finished in No. 14 stand. These are capable of coiling up to 1-inch diameter rounds and sections of equivalent area, in coils weighing up to 600 pounds. Each reel is driven by a 25-hp, adjustable-speed motor. They discharge directly to the same conveyor as used for the four laying reels.

Due to the physical limitations of the plant it would have been difficult to provide narrow-gage railroad service from the rod mill to the wire mill by normal methods. It was therefore decided to deliver the rods by hook conveyor to a point where such transfer could be more readily provided. In order to do this it was necessary to cross the mill buildings transversely at fairly high elevation, and to provide automatic methods for lowering the coils from this elevation to the ground level.

As the system was designed, the hook conveyor picks up the coils automatically from the chain conveyor and carries them up a slope for about 600 feet. It then turns 90 degrees and travels horizontally across the mill building at approximately crane-girder level. On this last stretch the coils are inspected and tied.

At a point about 340 feet from the turn the coils are automatically tripped off the hooks and dropped into a chute which discharges into special narrow-gage coil cars at ground level.

The coil cars are chain driven and the controls are so arranged that a string of six cars may be automatically indexed the width of one coil as soon as a coil drops into place. Provision is also made for automatically indexing from one car to the next a distance of about 3 feet, as soon as a car is filled. When all cars are filled the string is transferred to the adjacent wire mill by narrow-gage locomotive.

When a string of empties is returned from the wire mill the cars are shifted to a track which is so sloped that they run by gravity into a position where they can be engaged by the dogs of the chain drive, for indexing under the conveyor chute. This arrangement makes it unnecessary to have a locomotive engaged in this service 100 per cent of the time.

The bar mill and the blooming mill are housed in two adjacent parallel buildings. Both are approximately 88 feet wide, the bar mill building being 636 feet long, and the blooming mill building 676 feet. They are made with corrugated metal siding and monitor roof of the same material. On the long sides the buildings are open to a height of 12 feet 8 inches, with two rows of sash above.

New Crane Shown

Extendable from its minimum boom length for crane work of 30 feet to a maximum of 100 feet by addition of standard intermediate sections, a new truck crane and carrier combination, announced by Northwest Engineering Co., Chicago, has all main operating machinery mounted on cast steel side frames. All high-speed shafts are said to be mounted on ball or roller bearings. A "feather-touch" clutch control, which utilizes the power of the engine to throw heavy drum clutches, uniform pressure swing clutches and a high-speed, power-controlled boom hoist, independent of all other operations, are standard equipment.

"Perfectly Shaped" Cones Produced by

PLATE BENDING ROLL

DISADVANTAGES of the conventional method of press bending a few inches at a time are overcome by a new method of forming cones in 1 inch steel plates, developed by National Annealing Box Co., Washington, Pa. The company uses a plate bending roll which is said to save much time and also produce a perfect cone instead of one with longitudinal marks made by the previous process. The method reportedly is applicable to plate of other thicknesses also in widths up to 14 feet.

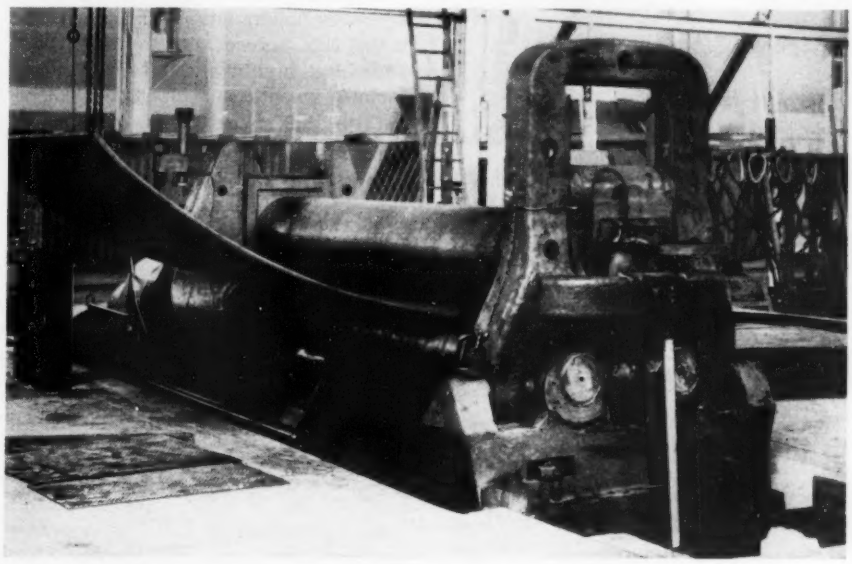
Success of the method lies in the manipulation of the top roll of the 14-foot, pyramid type Baldwin Southwark plate bending roll, the company states. One such cone, used as the base of a pressure vessel, is made of 1-inch low-carbon steel plate and is 8 feet in diameter at the base and 3 feet in diameter at the top. It has a slant height of 10 feet. The cone is completed by welding and the neck is welded to a 36-inch OD, 1-inch wall stainless steel cylinder. The 14-foot roll is said to shape 1½-inch plate into a cylinder as small as 33 inches ID. The main driving motor is 75 hp and the screwdown motor is 40 hp.

Recently made by the company was a fractionating column for the Netherlands to be used in supplying high octane gasoline to the Berlin airlift. In fabricating such a column, steel plates with machined edges and crimped ends were placed on the rolls. A single operator and a helper shaped the plate into the desired form, less than 30 minutes being required to make a cylinder of the heavy plate. Under the system used, the helper generally handles the radius gage or "sweep", fitting it into the shell to measure the amount of roll accomplished and still needed.

The fully rolled cylinder is removed by lowering the hydraulic drop end and tack-welding longitudinally. It is then automatic-welded on the inside, after which the outside groove is gouged and welded. The cylinder may be replaced on the rolls one or more times for resizing to a true radius after welding. These completed cylindrical sections are then welded end to end to the ordered length of the column, the machined ends insuring a column that is perfectly straight.

Although most of the company roll structures are cylindrical or conical, other related shapes are fabricated on the bending rolls. The company has completed five dipper sticks for heavy power shovels. The complete cylindrical members are said to be replacing structural dipper sticks on the larger power shovels such as those used in strip mining. These shovels are now sized and powered to hold as much as 36 cubic

In this fabricating operation, 1 inch plates are rolled into cylinders 14 feet long with an inside diameter of 33 inches, and are then welded end to end. Dipper sticks to a maximum length of 81 feet 6 inches, comprising six lengths of cylinders, have been made by the company. Despite a weight running up to 22 tons, the fabricated dipper stick is reported to be still lighter than the previously used types, as well as being considerably stronger.



Catalog Lists Russian Scientific Papers

Fields of science and technology covered by the translations offered in Catalog No. 34, "Supplementary List of Translations of Russian Technical and Scientific Articles Published During the First Quarter of 1949" range from aerodynamics to inorganic chemistry, organic and physical chemistry, crystallography, electron-optics, metals, metallurgy and mineralogy. The catalog is available from Research Information Service, 509 Fifth Ave., New York 17, N.Y., free of charge.

It supplements previous lists of Russian translations—Catalog No. 27, Russian petroleum production and Catalog No. 29, Russian chemistry. According to the translators, it should be read in conjunction with these catalogs in order to get a complete listing of the translations from the Russian which are available.

30-Ton Mine Locomotive

Designed for haulage over long runs where the distance from gathering point to the tipple is 5 miles or more is the new 30-ton, high speed, four-axle mine-haulage locomotive announced by Locomotive and Car Equipment Divisions of General Electric Co., Schenectady 5, N. Y. It has a speed of 35 mph maximum and 480 hp. Drawbar pull is 15,000 pounds at a speed of 10.5 mph or a maximum drawbar pull of 18,000 pounds.

Carbide Tool Catalog Contains Much Information

Besides detailing the complete line of cemented carbide tools offered by Kennametal Inc., Latrobe, Pa., the company's new catalog contains much additional information, including a description of Kennametal compositions and mechanical and physical properties. Other sections are devoted to how to design for best results from Kennametal, recommended grades and suggestions for cutting speeds on steel of different hardnesses and machining hints for steel, cast iron and nonferrous materials.

Standard types of tools, special blanks, standard boring tools, centers and half centers are also included.

Air hoists are used in dipping Jato solid propellant motor cartridges in liner coating. Smooth controlability and spark-free operation contribute to safety in production of 20,000 units per month. Courtesy Compressed Air and Gas Institute

Compressed Air Devices

Aid in Rocket Production

BECAUSE of their spark-free safety factor, air-operated hoists are among the compressed air operated devices used in the production of Jato solid propellant motors in the Azusa, Calif., plant of Aerojet Engineering Corp. These 80-pound power sources, used as a booster for Aerobee upper atmosphere rockets which are sustained in flight by liquid rocket motors, are dipped by hoists to acquire a liner coating.

The coating, together with a binding of tape on the cartridge, helps restrict the burning of the propellant charge. Air-operated turntables, actuated by foot pedals, are used in the wrapping operation. As with the air-operated hoists, advantages gained in using this type of turntable for handling the highly sensitive cartridges include smooth action, good controllability and sparkless safety.

Expended motors returned to the factory for recharging, are reconditioned, also with the aid of air devices. The empty chambers are first sandblasted, then checked for alignment of bosses and attachment brackets, finally recharged and repainted. Two 9 x 9 single-stage horizontal air compressors supply air for these functions and for others which cannot be described for security reasons.

Precise regulation is required for controlling the propellant flow of an Aerobee liquid rocket motor, as the separate supplies of fuel and oxidizer are fed into the motor at a constant flow by pressure from a tank. The pressure regulator, which is set for the desired value, is checked for accuracy by compressed air by removing it from the line and testing with air from a cascade of air reservoirs at pressures in excess of 2000 psi. A portable compressor is used on this operation.

A loop system is used for distributing the air to the point of work. The 68-acre plant layout and nature of work being performed require that compressors be located in different parts of the plant rather than at a central location. The loop system permits distribution of air either way to meet peak load requirements and maintain constant pressure. It also permits shutting down a unit for maintenance.

Corrosion Resistance of Stainless in Acids Studied

Sensitization of type 316 stainless steel causes a much greater increase in corrosion rate in boiling 65 per cent nitric acid than in boiling acetic, lactic or phosphoric acids, recent tests on comparative corrosion resistance of stainless steels in various acids disclosed, according to R. B. Mears, C. P. Larrabee and C. J. Fetner of Carnegie-Illinois Steel Corp. research laboratory, in a paper presented before the American Society for Testing Materials annual meeting in Atlantic City, N. J. The type of attack which develops on annealed or sensitized types 304 and 316 specimens in the boiling nitric acid test generally is qualitatively similar to the type of attack which develops on exposure of these materials to other boiling acids, providing any definite attack occurs.

It was brought out that type 316 specimens, which developed definite intergranular attack upon exposure to the boiling nitric acid test, showed no apparent attack upon exposure to boiling acetic or boiling lactic acid. Of little value in rating the relative corrosion resistance of various stainless steels to acid solutions other than that used in the test itself is boiling nitric acid, the speakers asserted.

The boiling nitric acid test would appear to have some value in predicting qualitatively the type of attack likely to occur on stainless samples upon exposure to other acids. Rates of attack which occur on specimens of different stainless steels exposed to the boiling nitric acid test give an incorrect indication of the relative corrosion resistance on these alloys to other acids. It was also said that results of the boiling nitric acid test are influenced by the type of heat treatment to which the stainless steel specimens have been exposed.

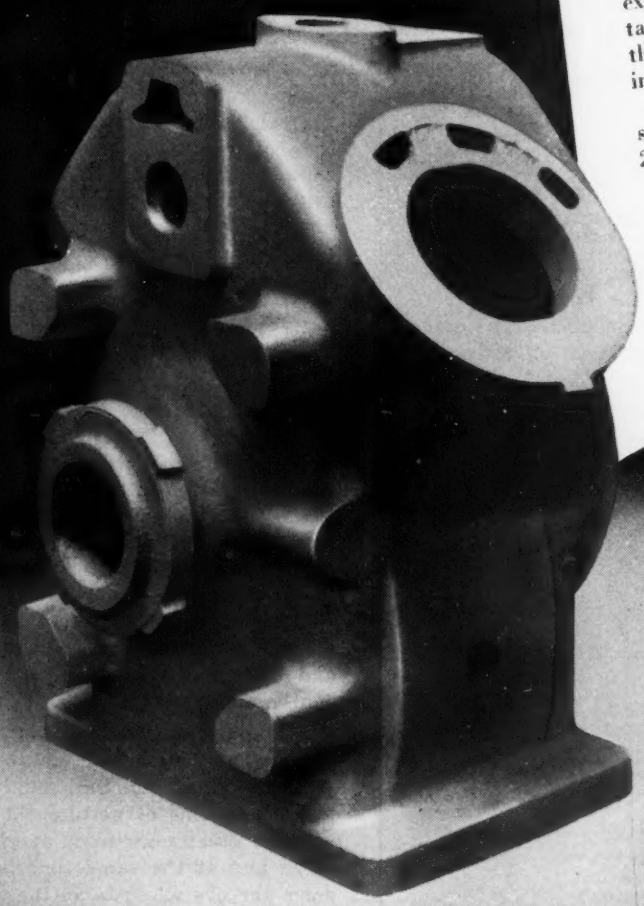
Iron, Steel Works Maps

Recently published is a map of the iron and steel works in the United States and Canada, based on the *Iron and Steel Works Directory,* which shows the location and extent of the industry. A geographical index shows the companies operating in each city and letters before the company names indicate which of 14 product classifications the respective companies handle. Maps are available in various sizes, either mounted or unmounted, from J.H.H. Muirhead, 230 W. 108th St., New York 25, N. Y.

Structural Design Book

How to design load carrying aluminum structures is the subject of a 124-page handbook, "Aluminum Structural Design", issued by Reynolds Metals Co., Louisville, Ky. The book is said to enable the engineer familiar with mechanics of materials to design an original structure of aluminum, or to convert an existing structural design from some other material to aluminum. Among the chapters are ones on figuring tensile stresses, compressive stresses, bending stresses and shear stresses. Another section is devoted to fabricating considerations and joining methods.

Quick Casting Service (coast to coast)



Coast to coast . . . you'll find modern Alcoa foundries. Each provides the latest production machinery for economy. Each employs foundry men with 20 and 30 years of aluminum experience. Molders and coremakers who guarantee you quality castings. Each draws from the extensive knowledge gained from Alcoa's 61 years of light metal experience. These are the exclusive advantages that make Alcoa your *best* source for the *best* sand and permanent-mold castings in aluminum.

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Tooth Finishing

(*Concluded from Page 80*)

In keeping with the modern concept that one of the most effective ways to speed up floor-to-floor time is to speed up and improve methods of loading and unloading the work in a machine tool, a quick-acting air operated fixture is built into the machine. This is shown in Fig. 1.

The cycle of operation is as follows: At the completion of a previous cycle, the machine stops automatically and the work backs away from the cutter an amount equal to the depth of the cut that was taken. Thereupon, the operator lifts the safety guard. This breaks contact with a button which controls the air-operated workholding mechanism already mentioned.

The operator then lifts out the finished gear and inserts one to be finished—the cutter itself acting as an accurate "work setting gage"—the cutter having remained in contact with the work at the end of the previous operation.

The "start" button now is pushed. This actuates the clamping mechanism, thus preparing the machine to go into action—which it does when the safety guard is lowered. Cutter and work begin to rotate with clamping pressure on the work rather light. After a few revolutions, full clamping pressure is applied, the work withdraws from the cutter and the cutter rapidly traverses the work to "starting point".

The work then automatically advances to "depth of cut" and the cutter traverses across it at the prescribed feed. As is indicated by Fig. 3, the system is marked by free cutting action resulting in removal of real chips—and not in burnishing action. Both sides of the teeth are shaved in one traverse. While considerable amounts of metal can be removed, it naturally is better to hold this to a reasonable minimum to prolong cutter life.

The degree of finish produced on the teeth is governed to a considerable extent by the traverse feed of the cutter, this being variable through change gearing to give desired finish. Traverse feed, however, within reasonable limits, has no effect on the accuracy of the gears processed by this system. As has been indicated by this description, the entire cycle is automatic, except for loading and unloading—this including automatic lubrication. Incidentally, an important unit incorporated into the design is a magnetic separator which prevents chips from being recirculated with the cutting oil which would mar the fine finish.

The solid character of this machine is indicated by the fact that it weighs 11,700 pounds. It will handle a wide range of gears, up to 12 inches maximum pitch diameter, 12½ inches outside diameter, and 5 inches diametral pitch. Cutters up to 7¼ inches maximum outside diameter, 8¾ inches maximum face width (6½ inches on gears over 9 inches in diameter), and 45 degrees maximum helix angle can be employed.

This machine and method are typical of what the machine tool industry is contributing to the solution of users' problems of getting out more work of greater accuracy and higher finish and at the same time holding down the overall costs on the work.

—o—

Papers presented at the first short course on industrial packaging and materials handling, held at Chicago, Oct. 4 to 7, 1948 are available in the University of Illinois Engineering Experiment Station circular series No. 56. The bulletin is available from the University, Urbana, Ill., for $1.00.

CRANE and MOBILE SCALES

Team to Streamline Operations

MANUFACTURING and cost systems often require weighing of rough and finished materials but, because of the additional handling and rehandling necessitated by moving the materials to and from the scales, the operation frequently is not performed. By using a portable scale suspended from the hook of a Lorain self-propelled crane, made by Thew Shovel Co., Lorain, O., a midwest manufacturer has integrated the weighing operation with the regular loading and unloading operations, reportedly with a considerable savings in handling costs.

Large, rough items, such as castings, and the larger finished parts are stored in the yard because of their size and it is here that the crane, with its 15,000 pound capacity Yale scale attached, performs its weighing operations. The rubber mounted crane travels in either direction at a speed which suits the job. Incoming materials, received at one point, are towed in a trailer by the crane to their storage yard location, picked up, weighed and placed in stock in one simple operation.

Finished parts are handled and weighed in the same manner in filling shop requisitions. The crane carries the material on a flat car and, by using a bar connection, pushes the material into the shop for fabrication.

"For my money, *that's a home!*" says Milt Bennett

The Bennetts and Contractor Jensen, as painted from photographs.

Mr. and Mrs. Milton I. Bennett have a lot of STEEL in their new house on Long Hill Road, Briarcliff Manor, New York. They're so enthusiastic that, rain or shine, they spend many hours checking its progress.

After years in apartments and smaller houses, the Bennetts at last will have their ideal home. Through their contractor, Ludvig Jensen, they are building a compact house. Contractor Jensen has been building homes in Westchester County for 15 years. He knows what it takes to build a good home.

The Bennetts were surprised to learn from Mr. Jensen that 7700 lbs. of steel would go into the house—in the form of nails, flashings, pipes, hinges and hardware. Then to make the home more modern and convenient, there will be 2100 more lbs. of steel in the furnace, refrigerator, kitchen range, sink and dozens of other products. This means the Bennetts will own 9800 lbs. of steel in their up-to-date home.

Many of the 247 large and small steel companies in the United States make the various kinds of steel used in building and equipping homes. Because of keen competition and efficient production methods, the quality of steel is high and its price is the *lowest* of *all* metals. That is why the Bennetts and millions of other Americans can afford so much steel in their homes. That is *why* and *how* steel and the American system serve the people.

AMERICAN IRON AND STEEL INSTITUTE

Steel works for EVERYONE

350 FIFTH AVENUE, NEW YORK 1, N. Y.

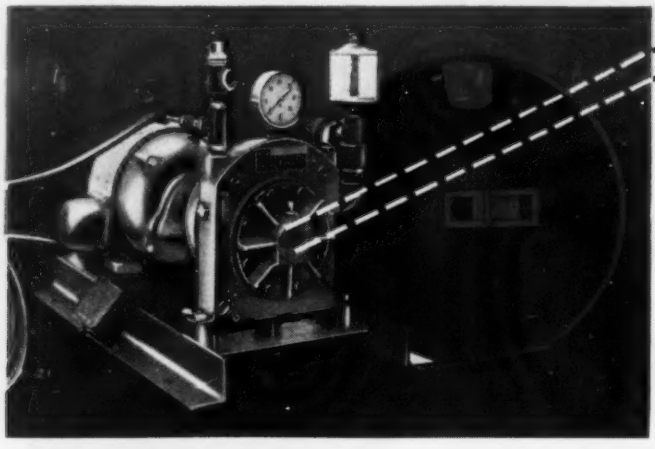
Dry bulk materials flow evenly through hopper with dry aeration from a

GAST rotary AIR COMPRESSOR

PROBLEM: Assure an even flow of dry bulk material through bin hoppers of portable and stationary concrete plants.

SOLUTION: Aeration of material around hopper opening with low pressure of 10 to 15 p.s.i., volume of 8½ c.f.m. A Gast 1065-P17 Rotary Air Compressor supplies dry, non-pulsating air at low cost with ½ to ¾ h.p. motor or V-belt from gas engine.

RESULT: Excellent. This manufacturer has used Gast Units as original equipment for many years.



Another problem solved with AIR!

Whether your problem is similar—or far different from this—you too may find that "Air may be *your* Answer". As original equipment for literally hundreds of applications, Gast Rotary Air Compressors, Air Motors and Vacuum Pumps help manufacturers to improve their *products*—and *save money!*

For example, consider the Air Compressors used on this application. They deliver *positive pressure without pulsation* . . . and *without a bulky air tank* . . . at lower initial cost. And they offer many other advantages—resulting from the *utter simplicity* of their sliding-vane Rotary Design.

It may pay you to investigate the performance and economy of Gast's more than 200 models. Inquire today . . .

WRITE TODAY!

Request your copy of this NEW booklet, "APPLICATION IDEAS"

"AIR MAY BE YOUR ANSWER!"

GAST ROTARY

AIR MOTORS (TO ONE H.P.) · COMPRESSORS (TO 30 LBS.) · VACUUM PUMPS (TO 28 INCHES)

GAST MANUFACTURING CORP., 133 Hinkley St., Benton Harbor, Mich.

Washing Installation and Core Oven Announced

Three thousand pounds of enameled steel core laminations may be baked in an hour in an uninterrupted cycle in a continuous conveyor type oven designed by W. S. Rockwell Co., Fairfield, Conn. After the work has passed between the coating rolls on the charging end of the system, it is efficiently handled by a conveyorized system through flashing, baking and cooling and is operated by only two men. Oven is said to normally operate at a temperature of 570 to 750° F, within close temperature limits.

Possibility of gas explosions as a result of extinguished burners is said to be nullified by a Protectoglow system which automatically shuts off the gas supply to any of the burners should flame failure occur. Speed of work through the oven may vary over a 4 to 1 range through the 31-inch long oven chamber. This chamber is built with 6 inches of insulation enclosed between Armco aluminized steel sheets.

Another development of the company is a continuous automatic installation for washing, rinsing, annealing, spray cooling, pickling, rinsing, washing, rinsing and drying in continuous sequence of brass screw bases for house fuses. The work moves mechanically at any required rate through every step in the process, requiring no labor other than at the charging end. The metal pieces, placed on a mesh belt conveyor, move into a hot spray wash section, thence successively through a drain-off, cold water rinse, another drain-off, annealing oven, cooling vestibule and spray cooling section, emerging at the other end ready for the pickling unit.

Electrically heated annealing oven is 5 feet long and is built of aluminized steel insulated panel. Normal operating temperature ranges from 500-600° F. The pickling section consists of a series of perforated stainless steel drums rotating in stainless steel tanks for the consecutive operations of acid pickling, bright pickle with bichromate solution and two rinses.

—o—

Consisting of a simplified list of types and sizes of copper water tube and copper and brass pipe, simplified practice recommendation R217-49 is available for 10 cents from Government Printing Office, Washington 25, D. C., according to Commodity Standards Division of National Bureau of Standards.

New Products and Equipment

Steam Cleaner

Small in size, the recently developed Hypressure Jenny steam cleaner, that is announced by Homestead Valve Mfg. Co. Inc., Coraopolis, Pa., requires 27 x 37 inches of floor space and develops 80 to 120 pounds working pressure. Normal 45 gallons per hour capacity of the machine can be stepped up to 240 gallons per hour by means of an Adjusta-Blast gun, an accessory.

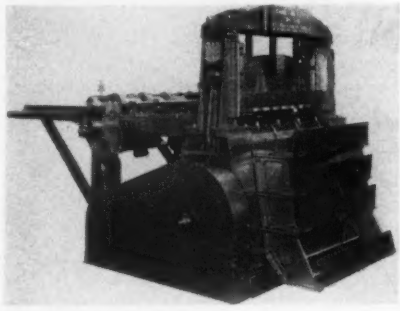
The Service Master cleaner, as it is called, has such features as instant starting and steaming, automatic nozzle control mechanism which permits operator to stop and start machine at the cleaning job and selective compound and fuel feed to give best results, features which are also included in larger units. All units are oil-fired and electric motor driven.

Check No. 1 on Reply Card for more Details

Scroll Shear

Lima-Hamilton Corp., 60 E. 42nd St., New York 17, N. Y., is introducing the Hamilton-Kruse scroll shear for cutting of tinplate for subsequent production of can ends or for blanking tongued bodies for rectangular, round or tapered cans. The model No. 301 shear, for operation at high speed, has a long die slide and rigid frame, which together give true die alignment and maximum die life. Operating mechanism is located below the table, resulting in an oil and grease-free work table.

As the sheets are fed into the die, they are pushed back against positive stops at each stroke, so that each cut is accurately spaced. Intake table has a squaring or gaging device and slitter attachment which trims two sides of the sheet parallel and automatic fingers carry sheets to the die for cutting. Safety devices also are incorporated in the machine. Minimum and maximum sheet width and length, respectively,

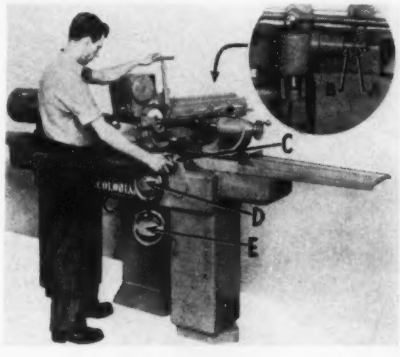


are 25, 36, 25 and 36 inches. The machine is capable of from 60 to 100 strokes per minute. Power is supplied by a 3 hp motor.

Check No. 2 on Reply Card for more Details

Broach Sharpener

Colonial Broach Co., Detroit 13, Mich., is producing a model CS-36 universal broach sharpener for faster sharpening of both internal and surface broaches up to 36 inches long and 6 inches in diameter. Reduction in sharpening time for various types of broaches such as round, serration, spline, etc., is the result of a step-stop microfeed. This speed is composed of a microfeed handwheel (C) which controls the setting of a plunger (B) in the step-stop control. Bracket (A) when it contacts the plunger limits travel of wheel when using the easy-swing hand lever. Setting of bracket (A) for any broach is made with the wheel at full depth on the largest diameter tooth of the broach and with the plunger all the way out.

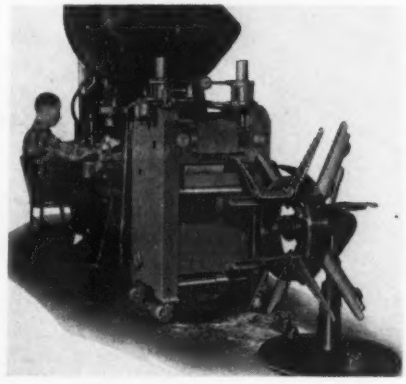


Additional feed required from tooth to tooth as the broach diameter decreases is provided by the microfeed handwheel. This feed is approximately equal to the step per tooth. Handwheel (D) is for raising and lowering the head on the column. To grind flat broaches, head and tail stock are replaced by a magnetic chuck. Head movement for the flat broach sharpening is controlled by a second handle on the head.

Check No. 3 on Reply Card for more Details

Compound Spreader

Drawing compound may be applied with rollers that are adjustable for speed, thickness of metal and quantity required with the spreading machine designed by Union Tool Corp., Warsaw, Ind. Metal is fed from roll stock or in sheet form by the machine, models of which are built to take metal 1 to 96 inches wide. Spreading machine speed is limited only by the press operation. Inasmuch as the application operation is performed by the machine, it makes the operation safer for the operator and allows him to devote more time to productive efforts.



Check No. 4 on Reply Card for more Details

Evaporation Meter

Developed for the determination of evaporation rates of all solvents of a viscosity less than 100 cp is the precision shell Evaporometer made by Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill. The automatic filling microburet releases a sample on the filter paper cone which is suspended from a helical quartz spring and is rotated by a motorized electromagnet to distribute the sample evenly. After the cone is "freed", the sensitive spring rises as the sample evaporates.

Knobs on the outside of the case raise or lower the spring and cone assembly, centimeter scale and mirror. Case is fitted with an outlet for timing mechanism. Volume

"MULTICUT" "TUFCUT" "HOT WORK"

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SHEAR BLADES
and ROTARY KNIVES

Any type or size blade of proper Alloy with correct hardness and temper for every type shearing machine and every kind of job.

Rx ENGINEERED TO THE JOB

Every Wapakoneta blade is made to exact specifications, designed for the particular job. Complete records with order number of each blade makes possible duplication of exact size and temper at any time.

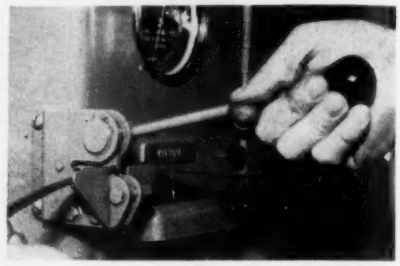
The WAPAKONETA MACHINE CO.
Shear Blade Specialists Since 1891
Wapakoneta, Ohio

of air drawn through the apparatus is indicated and controlled by an adjustable rotameter. A serrated hose connection at the base is provided for connection to a vacuum line.

Check No. 5 on Reply Card for more Details

Cutoff Shear

An improved cam and lever actuated shear that cuts off flat strip stock and the chief use of which is cutting off bandsaw blade square and flat in preparation for welding into a band, is offered by DoAll Co., Des Plaines, Ill. Because the shear has a wider shearing surface and



stays sharp longer, it produces a smoother cut. It can be mounted on the saw or permanently on wall or bench.

Other uses may be in the salvaging of metal strapping and baling ties, joining wire and coil stock for punch press roll feeds, etc. A piece of blade ⅛-inch wide is removed so that an old weld can be cut out at the same time the blade ends are squared in preparation for a new weld.

Check No. 6 on Reply Card for more Details

Nuclear Instrument

Nuclear Instrument & Chemical Corp., 223 W. Erie St., Chicago 10, Ill., is making available two types of complete laboratory setups for users of radioactivity techniques, either one

of which can be chosen to provide complete facilities for routine counting or research work, depending upon the type of operation the user requires. Model L-165 is a basic group which includes a complete scaling unit, a thin mica end window Geiger tube, a tube mount and the necessary

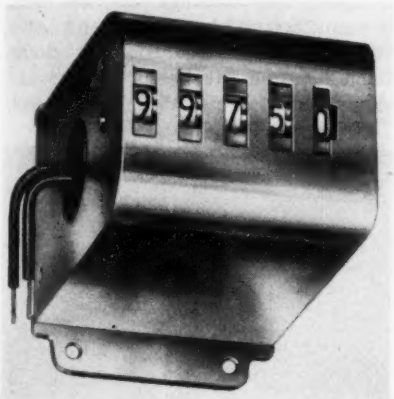
connecting cables and sample dishes to permit radio-tracer research. A model SM60 timer is also suggested if the user does not already have a timer.

Model L-163 radioisotope analyst group, is designed for the analysis of radioactivity. It includes a complete automatic scaler plus a Q-gas counter. With these instruments precise work can be done with low activity, low energy samples. When used with a model T1 timer, operation is completely automatic. Either predetermined time or predetermined count operation can be accomplished without attention from the technician.

Check No. 7 on Reply Card for more Details

Magnetic Counter

Series 1268 non-reset magnet counter, announced by Veeder-Root Inc., Hartford, Conn., is for installations which do not require a high number of accumulated counts or



high speeds. Designed for building into new machines, the counter has five figures.

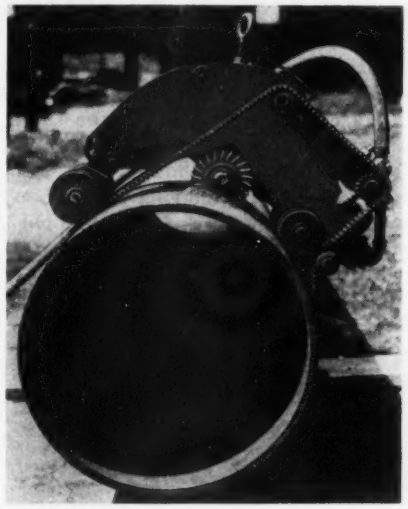
Fifty counts per minute is the maximum recommended. Coils operate on 110 v ac and current consumption is 8 w maximum. Overall dimensions are 1¾ x 2¼ x 2 13/32. Actuated through electromagnets, they can be connected in series with any device having a contacting arrangement.

Check No. 8 on Reply Card for more Details

Pipe Saw

Cast iron or steel pipe from 12 to 48 inches in diameter may be cut at the rate of 2 inches per minute with a new air powered saw, introduced by E. H. Wachs Co., 1525 N. Dayton St., Chicago 22, Ill. Machine uses a high speed steel milling cutter which leaves clean cut milled edges and requires 85 pounds of air pressure for operation.

Changes in adjustment for different pipe sizes are made by setting guide rollers and alternating the two travel-chain lengths. Saw is strapped tight to the pipe by two chains that act as flexible ring gear for feed which

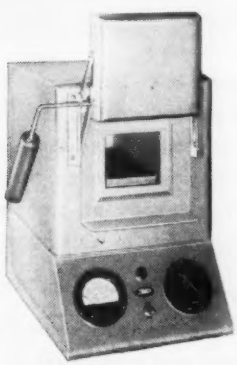


automatically compensates for pipe irregularities. Cuts above ground are made by rolling the pipe on skids. Sealed construction permits cuts to be made under water where ditches are flooded.

Check No. 9 on Reply Card for more Details

Electric Furnace

A control knob regulates the current input in series 1500 bench-type electric furnace, made by Thermo Electric Mfg. Co., Dubuque, Ia., any-



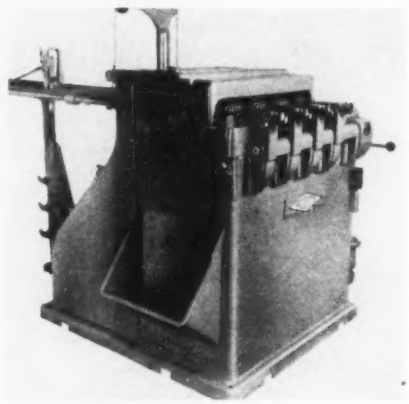
where from 5 to 100 per cent of the time "on" and at any desired temperature from 350° F to the maximum. The furnace heats rapidly and can be operated continuously at temperatures up to 1650° F and intermittently to 1900° F. Control panel also houses an indicating pyrometer calibrated in both Fahrenheit and Centigrade scales, a toggle switch and neon signal light.

Furnaces may be used for such laboratory work as ashings, ignitions, fusions, process control, etc., and for hardening and tempering small steel parts and tools. Heating elements are embedded in refractory plates forming the sides, top and bottom of the heating chamber. Elements are of heavy gage nickel-chromium alloy. Furnace body is of welded steel construction with dual insulation 3 inches thick. Chamber sizes of 3½ x 4 x 4½ inches and 3½ x 4 x 9 inches are offered.

Check No. 10 on Reply Card for more Details

Cutoff Machine

The Bar-Matic 4-spindle machine for chamfering, external forming, grooving, beveling and cutting off of bar stock, made by Producto Machine Co., Bridgeport, Conn., has a bar feed arrangement which uses low air pressure for rapidly feeding four 12-foot bars simultaneously to four adjustable stops. Four sets of forming and cutoff tools are mounted on a horizontal slide which is cam-operated longitudinally, assuring preservation



of initial accuracy regardless of temperature conditions.

Spindle speeds are infinitely variable from 900 to 2000 rpm. Cycle changes are obtained by hand wheel control without stopping machine. Complete parts, formed and cut off, may be produced at the rate of 1400 to 2400 pieces per hour. Capacity in diameter is ⅝-inch maximum with cutoff length to 6⅝ inches.

Check No. 11 on Reply Card for more Details

Bender Cabinet

Of welded steel construction, the floor cabinet for Di-Acro benders, made by O'Neil-Irwin Mfg. Co., Lake City, Minn., is designed to withstand the pressure to which it will be subjected in the bending of heavy materials. Cabinet dimensions are 15 x 15 x 34 inches and the working height with a bender mounted is 38 inches. Net weight is 90 pounds.

Two shelves are built into the cabinet to provide storage space for the various bending mandrels usually

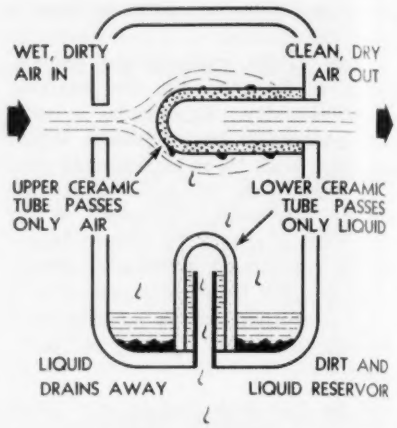
used with the machines. Either the No. 2 or 3 model bender can be mounted on this stand.

Check No. 12 on Reply Card for more Details

Air Gas Filter

Automatic and continuous removal of water and water-oil emulsions from compressed air or gas lines is carried out by the Liqui-jector, produced by Selas Corp. of America, Erie Ave. and D St., Philadelphia 34, Pa. The equipment, applicable to liquid separation, agitation, drying, spraying, instruments and pneumatic mechanisms, accomplishes liquid separation and ejection by two ceramic tubes—one water-repellent, the other water-permeable but air-impervious. Compressed air or other gas passes through the first tube where it is separated from contamination and dirt. Moisture drops to the bottom and drains through the second tube without loss of air.

Water ejection rates for the three sizes of equipment vary from 0.5 to 2.5 gallons per 24 hours. Unit also acts as a filter, removing atmospheric dirt and finely divided solid particles, even finer than 100 microns in diameter. Housing is made of cast bronze. Maintenance is limited to


WET, DIRTY AIR IN
CLEAN, DRY AIR OUT
UPPER CERAMIC TUBE PASSES ONLY AIR
LOWER CERAMIC TUBE PASSES ONLY LIQUID
LIQUID DRAINS AWAY
DIRT AND LIQUID RESERVOIR

periodic inspection and removal of accumulated dirt.

Check No. 13 on Reply Card for more Details

Your confidence in a stamping source is an item we can't buy—but *we can earn* it! You see, buyers of small to medium-large stampings across the nation have *solid reasons* for the trust they place in us—and we invite you to join this distinguished clientel. If your products require coining, as well as blanking, piercing, forming, drawing—or close tolerances—or are suitable for automatic or progressive press operations—we're sure you'll profit from an association in which you find

- **35 years of dependability, promises well-kept**
- **Broad experience, including extensive tool-engineering "know-how"**
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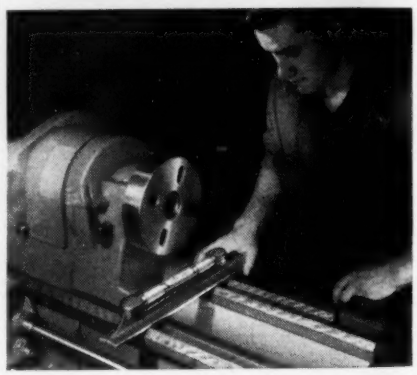
Our new booklet "Stampings", describes our plant, over 75 presses and other equipment and the range of our production. Please write for your copy and the name of our Stampings Sales Representative in your area.

DETROIT STAMPING COMPANY
359 Midland Avenue — Detroit 3, Michigan

Manufacturers of famous De-Sta-Co Toggle Clamps, Arbor Spacers, Shims, Shim Stock, Blower Housings, Refrigerator Compressor Valves.

Machine Tool Level

A sensitive 12-inch precision level, designed for leveling machine tools, is manufactured by South Bend Lathe Works, 390 E. Madison St., South Bend 22, Ind. It has a ground and graduated vial mounted in a 12-inch



cast iron frame with the base precision ground on all useful surfaces including the V-way for leveling shafts. Vial is mounted in the frame and protected from accidental breakage by an aluminum alloy cylinder which may be revolved to completely enclose the vial.

Check No. 14 on Reply Card for more Details

Scrap Truck

Designed to work with a revolving head fork lift truck is a Turner system scrap truck announced by Factory Service Co., 4615 N. 21st St., Milwaukee 9, Wis. Unit consists of a bin-like superstructure of heavy steel plate panels welded to a flat steel deck. Fabricated steel channels, built to accommodate standard fork lift trucks, extend from front to rear above the deck. Cast steel or rubber

"Why doesn't our company do like other companies?"

If you haven't yet installed a Payroll Savings Plan in your company, you can be pretty sure some of your employees are asking that question. For workers *like* this easy, automatic way of investing in U. S. Savings Bonds—and more than 20,000 large companies have made this convenience available to the people on their payrolls.

WHAT GOOD IS "PAYROLL SAVINGS"?

The Payroll Savings Plan is the *only* means by which people can obtain Bonds automatically on the installment plan. It pays off in many ways: increased security for the individual, who gets back $4 for every $3 when the Bonds mature; company benefits due to improved worker morale —a reduction of absenteeism, labor turnover, and accidents; increased national security, because Bond sales spread the national debt.

HOW MANY CAN AFFORD BONDS?

Deductions for taxes and other purposes which reduce take-home pay should not be confused with allotments for Bonds, which are taken home as *interest-paying savings*. Of course, the cost of living makes it tough for some people to buy Bonds. But nation-wide experience indicates that 40-60% of the employees in any company can be persuaded to sign up for Payroll Savings—without high-pressure selling.

7,500,000 workers are regularly buying an individual average of $20 of Savings Bonds per month. Show your employees that you want them to have the convenience of Payroll Savings. You'll find it easy to set up the Plan in your company. All the materials and assistance you need are available from your State Director, U. S. Treasury Dept., Savings Bonds Division. (See your phone book.) Why not talk it over with him now?

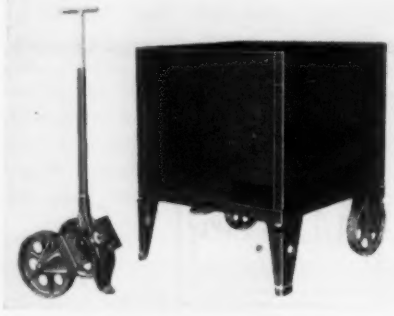
The Treasury Department acknowledges with appreciation the publication of this message by

STEEL

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

tired wheels are the only moving parts.

A revolving head fork truck can pick up the unit from either front or back, take it to the next machine or move it directly to the scrap pile. When forks are engaged in the chan-

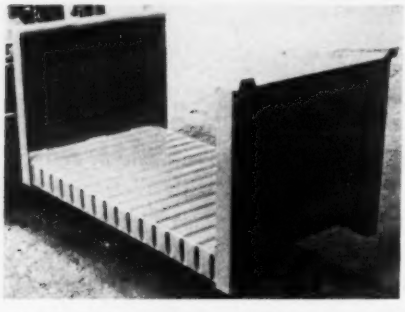


nels, the scrap truck can be turned to any desired angle. A hand jimmy converts the stationary bin to a maneuverable hand truck. Scrap truck is offered with steel sides 20, 24, 28, 32 and 36 inches above the deck.

Check No. 15 on Reply Card for more Details

Pallet Rack

Union Metal Mfg. Co., Canton, O., is offering an open-side pallet rack No. J-220-Y5 which can be used to tier unit loads of odd shapes and sizes. Open sides make the materials



easily accessible, an advantage in storing or removing materials and taking stock inventory.

Rack is made for both heavy and light loads. When tiered 4-high, the pallet rack easily accommodates stacked loading exceeding 24,000 pounds.

Check No. 16 on Reply Card for more Details

• • •

LOAD VISUALIZER: A new and improved alternating current load visualizer, combining five instruments in one, is announced by General Electric's Meter and Instrument Divisions, Schenectady 5, N. Y. Besides serving as a standard 0-2.5/5/-25/50 amp meter and a 0-150/300/600 v voltmeter, the type AF-2 visualizer can be used with a split-core or conventional instrument transformer to extend range for determining watts, vars, volt-amperes, and power factor.

Check No. 17 on Reply Card for more Details

CHAIN COUPLINGS: Morse Chain Co., Detroit, Mich., announces adoption of a new single connecting pin design for their series DRC, stock double roller chain couplings. This design increases ease with which roller chain couplings can be assembled or disassembled. They are made in seven sizes ranging in capacity from 2.7 to 97.0 hp per 100 rpm, and are carried in stock with a wide range of finished bores.

Check No. 18 on Reply Card for more Details

ADAPTERS: Applied Research Laboratories, Glendale 4, Calif., have designed spectrograph quantometer line of adapters which may be attached to spectrographs already in use. Adapters will convert a standard spectrograph into a direct reading instrument.

Check No. 19 on Reply Card for more Details

KNURLING WHEEL: Kennametal Inc., Latrobe, Pa., has developed a knurling wheel of solid Kennametal for roughing up the surface of mill rolls. The wheel is suported on a solid Kennametal pin held in the fixture.

Check No. 20 on Reply Card for more Details

NAILER: A new hand-operated portable nailer with an automatic feed is offered by Heller Co., Cleveland 14, O. It drives and countersinks with one blow the longest of the company's lock-nail through light metal, prestwood, hard and soft wood.

Check No. 21 on Reply Card for more Details

ALARM SILENCER: To eliminate the danger of forgetting to close hand opened knife switches in alarm circuits, a new alarm silencer, type ABS, is announced by Automatic Control Co., St. Paul, Minn. It is designed to provide continuous protection even though warning sound is stopped. A red light remains on until trouble is corrected. When circuit is clear, silencer automatically resets itself and light goes out.

Check No. 22 on Reply Card for more Details

BAR SOLDERS: The new type tin-lead bar solders announced by Federated Metals Division, American Smelting & Refining Co., are machine cast in Castomatic equipment. Oxides in metal are eliminated and solders have improved fluidity and easier working properties. Segregation of solder elements is virtually eliminated thereby insuring uniform melting temperature from one end of the bar to the other.

Check No. 23 on Reply Card for more Details

FIRE EXTINGUISHER: The new dry chemical type fire extinguisher, announced by C-O-Two Fire Equipment Co., Newark, N. J., is highly effective on flammable liquid and electrical fires. A self-contained unit, it is available in both 20 and 30 pounds capacity.

Check No. 24 on Reply Card for more Details

LIMIT SWITCH: Micro Switch, Freeport, Ill., announces the new Micro-Limit precision limit switch. It is designed for use on all types of machinery and industrial equipment. It is designed for an electrical rating of 20 amp, 110, 220 or 460 v, ac; ½ amp, 115 v, dc; ¼ amp, 230 v, dc; ¾ hp, 110 v, ac; 1½ hp, 220, ac.

Check No. 25 on Reply Card for more Details

BALL PENETRATORS: Steel ball penetrators, designed for accurate hardness testing in all makes of Rockwell testing machines, are announced by Clark Instrument Co. Inc., Dearborn, Mich. They are available in 1/16, ⅛, ¼ and ½-inch sizes.

Check No. 26 on Reply Card for more Details

ELECTRODE: Designated as special No. 1, a new hard facing electrode for extreme abrasion and mild impact is announced by Wall Colmony Corp., Detroit 3, Mich. It is easy to apply on carbon or manganese steel parts. Rod is available in 14-inch lengths, diameters of ⅛, 3/16 and ¼-inch; Rockwell C hardness is 61 to 65, as deposited.

Check No. 27 on Reply Card for more Details

SELENIUM RECTIFIERS: A new line of selenium dry-disk rectifiers for battery charging applications has been developed by International Rectifier Corp., Los Angeles 43, Calif. They can be used for trickle, taper, quick or any other type of charge and are especially suited for unattended service. Individual selenium cell sizes range from 1¼ x 1¼-inch to 6¼ x 7¼-inch.

Check No. 28 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

SIGNS that suggest business activity might soon snap out of its recession complex were cropping up last week, and while there was sufficient ground for businessmen to continue exercising more than usual caution there was an increasing tendency toward optimism. Some metalworking companies, notably appliance makers, found it necessary to step up operations, others were completing mass vacations, some were engaged in protective buying against a steel strike, and others, convinced there was no prospect of immediate price cuts in steel, were buying to maintain proper inventories.

BOOKINGS—As a result of these influences, some mills are booked full for the third quarter on certain products, notably sheet grades. However, other mills still can make deliveries on most products in August. On the whole, products in tightest supply are pipe, galvanized sheets, and cold-rolled sheets. Adding pressure to demand for coated sheets is a government program increasing grain bin storage capacity. Renewed activity in the appliance industry is augmenting automobile makers' continued heavy requirements of cold-rolled sheets. Sheet specialties, such as silicon and stainless, continue in easy supply. Consumers of hot carbon bars report little difficulty in obtaining early shipments on practically all sizes of rounds up to 3 and 3½ in., and larger sizes extend two to three weeks further. Quick delivery can be had on cold drawn carbon bars, as well as hot-rolled and cold-finished alloy bars.

PRODUCTION—Among the upturns last week was one in steel ingot production. Rising 4 points over the preceding week, output attained 81 per cent of capacity, highest level recorded since the last week of June, and equivalent to 1.5 million net tons. Contributing largely to the upturn was the continued recovery at plants which had prepared the previous week for a steel strike. However, in at least one instance an improvement in business necessitated the restoring of steelmaking facilities to full operation.

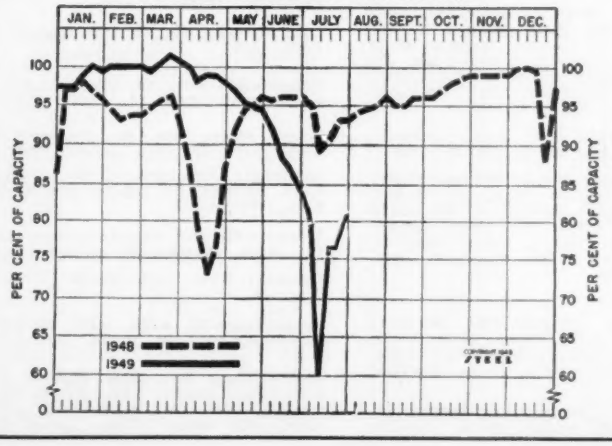
ARMS AID—Impact of President Truman's proposed $1.5 billion arms aid program, if approved, would not be felt in the steel and metalworking industries for some time, and then only moderately. Surplus stocks would be utilized as far as possible. Furthermore, the program is equivalent to an average of only two weeks' munitions production in the U. S. during the last war.

NEW CAPACITY—Evidencing confidence in the future, one steel producer last week announced plans for a new $12 million steelmaking plant of 400,000 tons annual capacity of ingots. Another producer announced it will spend $4.5 million to enlarge its blooming mill, while a pipe producer reported it will construct a new mill to permit re-entry into production of electric welded pipe.

PRICES—Accompanying new signs of bullishness last week was a stronger price tone in scrap in some districts. This pushed STEEL's scrap price composite to $19.34, compared with the preceding week's $19.17. A year ago the average was $43.33. Price composites on other product classifications held unchanged from the preceding week and compared with those for the like 1948 week as follows: Finished steel, $91.82 and $95.05; semifinished steel, $62.12 and $75.75; and steelmaking pig iron, $45.60 and $43.36. Elsewhere on the price front zinc and lead each rose half a cent last week.

PIG IRON—Renewed ordering of iron by some foundries indicates further completions of inventory reductions. In some instances demand for merchant iron in July was better than had been expected, and additional completions of inventory liquidation, along with an anticipated strengthening in castings demand, give promise that pig iron sellers will find August better than the preceding two months.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended July 30	Change	Same Week 1948	Same Week 1947
Pittsburgh	77	+ 2.5*	91.5	99
Chicago	90.5	+ 3.5*	89	94
Eastern Pa.	81	+ 1	90	94
Youngstown	72	+ 2	102	90
Wheeling	92	+ 6.5	82.5	89
Cleveland	93.5	+ 5*	99	93
Buffalo	96	+ 3	99	88.5
Birmingham	100	None	100	99
New England	12	+ 2	83	90
Cincinnati	91	None	103	94
St. Louis	75.5	—11.5	78	84.5
Detroit	106	+ 4	98	92
Western	76	— 1	..	..
Estimated national rate	81	+ 4	93	95

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons, 1948; 1,749,928 tons, 1947. *From revised rate.

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COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	July 30	July 23	Month Ago June 1949	Year Ago July 1948	5 Years Ago July 1944
Finished Steel	$91.82	$91.82	$92.06	$80.27	$56.73
Semifinished Steel	62.12	62.12	65.28	68.62	36.00
Steelmaking Pig Iron	45.60	45.60	45.60	40.49	23.00
Steelmaking Scrap	19.34	19.17	20.85	41.43	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

June 1949	4.01731c
May 1949	4.01731c
Apr. 1949	4.02031c
June 1948	3.57740c
June 1944	2.46683c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin pate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. June, 1949, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	July 30, 1949	June, 1949	Apr., 1949	July, 1948
Steel bars, Pittsburgh mills	3.35c	3.35c	3.35c	3.105c
Steel bars, del. Philadelphia	3.8164	3.8164	3.8164	3.545
Steel bars, Chicago mills	3.35	3.35	3.35	3.065
Shapes, Pittsburgh mills	3.25	3.25	3.25	2.975
Shapes, Chicago mills	3.25	3.25	3.25	2.965
Shapes, del. Philadelphia	3.4918	3.4918	3.4918	3.18
Plates, Pittsburgh mills	3.40	3.40	3.50	3.155
Plates, Chicago mills	3.40	3.40	3.40	3.115
Plates, del. Philadelphia	3.5848	3.5848	3.6348	3.41
Sheets, hot-rolled, Pittsburgh mills	3.25	3.25	3.26	2.975
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	3.70
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	4.10
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	2.965
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	3.70
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	4.10
Strip, hot-rolled, Pittsburgh mills	3.25	3.25	3.50	3.140
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	4.375	3.965
Bright basic, wire, Pittsburgh	4.15	4.15	4.15	3.965
Wire nails, Pittsburgh mills	5.15	5.15	5.15	5.255
Tin plate, per base box, Pitts. dist.	$7.75†	$7.75†	$7.75†	$6.74

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$62.80
Slabs, Chicago	52.00	52.00	52.00	47.80
Rerolling billets, Pittsburgh	52.00	52.00	52.00	47.80
Wire rod 7/32 to ¼-inch, Pitts. dist.	3.40c	3.40c	3.775c	3.415c

* Nominal. † 1.50 lb coating.

Pig Iron

	July 30, 1949	June, 1949	Apr., 1949	July, 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$44.08
Basic, Valley	46.00	46.00	46.00	40.60
Basic eastern, del. Philadelphia	49.39	49.39	49.6175	43.77
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	43.58
No. 2 fdry., del. Philadelphia	49.89	49.89	50.1175	44.27
No. 2 foundry, Chicago	46.25	46.25	46.25	41.10
No. 2 foundry, Valley	46.50	46.50	46.50	41.10
Southern No. 2 Birmingham	39.38	39.38	43.38	40.72
Southern No. 2 del. Cincinnati	45.43	45.43	49.43	46.43
Malleable, Valley	46.50	46.50	46.50	40.30
Malleable, Chicago	46.50	46.50	46.50	41.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	59.60
Ferromanganese, f.o.b. Etna, Pa.	175.00	175.00	175.00	150.00

SCRAP

Heavy melt. steel, No. 1, Pittsburgh	$21.00	$22.60	$25.12	$40.75
Heavy melt. steel, No. 2, E. Pa.	16.50	17.75	20.69	40.00
Heavy melt. steel, No. 1, Chicago	19.50	20.70	23.75	40.05
Heavy melt. steel, No. 1 Valley	18.50	21.30	22.75	40.75
Heavy melt. steel, No. 1 Cleveland	15.00	17.80	20.38	40.25
Heavy melt. steel, No. 1, Buffalo	19.25	20.35	24.38	44.30
Rails for rerolling, Chicago	27.75	27.75	31.31	57.80
No. 1 cast, Chicago	27.50	27.50	30.25	68.50

COKE

Connellsville, beehive furnace	$13.25	$13.70	$14.44	$14.25
Connellsville, beehive foundry	15.75	16.15	17.00	17.00
Chicago, oven foundry, ovens	20.00	20.24	20.40	19.86

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, nominal. Forging quality, $50 per net ton mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $57, Conshohocken, Pa.; $71, Fontana, Calif.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $63, Conshohocken, Pa.; $80, Fontana, Calif.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $65 Conshohocken, Pa.: $82, Fontana, Calif.

Sheet Bars: Nom., per net ton, mill; sales in open market $50-$55 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill.

Wire Rods: Basic and acid open-hearth, 7/32 & 9/32-inch, inclusive, 3.40c per lb, mill, except: 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Los Angeles Basic open-hearth and bessemer, 7/32 to 47/64-in., inclusive, 3.50c, Sparrows Point, Md.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.50c Atlanta; 3.55c, Ecorse, Mich.; 3.75c, Houston; 3.95c, Kansas City; 4.00c, Fontana, Calif.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.25c, Minnequa, Colo.

Rail Steel Bars: (Base 10 tons): 3.35c Huntington, W. Va., and Moline, Ill.; 4.00c, Williamsport, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 4.75c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.48c, Camden, N. J.; 5.40c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.30c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.50c, Atlanta; 4.00c, Fontana, Calif.; 3.75c, Houston; 3.95c, Kansas City; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 3.85c, Williamsport, Pa., mill; 3.35c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18-gage and heavier): 3.25c, mill, except: 3.45c, Ecorse, Mich.; 3.65c, Houston; 3.35c, Conshohocken, Pa.; 3.95c, Pittsburg, Torrance, Calif.; 4.15c, Fontana Calif.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 5.05c, Torrance, Calif.; 5.25c, Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.90c, Fontana, Calif.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 4.80c, Kokomo, Ind.; 5.15c, Pittsburg, Torrance, Calif.

Galvannealed Sheets: 4.95c, mill, except: 5.30c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill., Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c mill, except: 4.60c Granite City, Ill.; 4.70c, Ecorse, Mich.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren. Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.

Motor: 6.70c mill, except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.

Dynamo: 7.50c, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill; 65, 8.60c, mill, 58, 9.30c, mill, 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Galvanized (No 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.40c, Atlanta; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Houston; 3.85c, Kansas City, Mo.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, San Francisco, Los Angeles; 4.30c, Minnequa, Colo.; 4.40c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

Cold-Rolled Strip (0.25 carbon and less); 4.00c, mill, except: 4.00-4.25c, Warren, O.; 4.15c, Riverdale, Ill.; 4.20c, Ecorse, Mich.; 4.20-4.25c, Detroit; 4.25c, Dover, O.; 4.50c, New Haven and Wallingford, Conn., Boston; 4.50-5.00c, Trenton, N. J.; 4.90c, Fontana, Calif.; 5.75c, Los Angeles. One company quotes 4.50c, Pittsburgh base; another, 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.50c, Boston, Youngstown, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass. ,Wallingford, Bristol, Conn., Trenton and Harrison, N. J. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton and Harrison, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton and Harrison, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass., Harrison, N. J.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Tin, Terne, Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $17.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.50c, Coatesville, Pa., Claymont, Del., Conshohocken, Pa., Harrisburg, Pa.; 3.65c, Ecorse, Mich.; 3.80c, Houston; 4.00c, Fontana, Calif.; 4.30c, Seattle, Minnequa, Colo.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 4.50c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.40c, Ecorse, Mich.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 3.65c, Houston; 3.80c, S. San Francisco, Fontana, Calif; 3.85c, Kansas City, Mo., Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, Los Angeles.

Alloy Structural Shapes: 4.05c, mill.
Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Minnequa, Colo., Atlanta, Buffalo; 4.75c, Kansas City Mo.; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco. One producer quotes 4.15c, Chicago base; another 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill except: 4.90c, Sparrows Point, Md., Kokomo, Ind.; 4.95c, Atlanta; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo.; 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 5.20c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md., Kokomo, Ind.; 5.40c, Atlanta; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind., Atlanta; 109, Worcester, Mass.; 110, Minnequa, Colo., Cleveland; 123, Pittsburg, Calif. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 113, Crawfordsville, Ind.; 111 Houston, freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Kokomo, Ind., Atlanta; 116, Minnequa, Colo.; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 114, Crawfordsville. Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind., Atlanta; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base.

Fence Posts (with clamps): Col. 112, Duluth, Joliet; 121, Moline, Ill.; 122, Minnequa, Colo.; 125, Johnstown, Pa.; $120 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 107, Atlanta; 108, Sparrows Point, Md., Kokomo, Ind.; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Stainless Steels

(Mill prices, cents per pound)

CHROMIUM NICKEL STEELS

Type No.	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301	28.50	30.50	37.50
302	28.50	33.00	37.50
303	31.00	36.50	39.50
304	30.00	35.00	39.50
316	46.00	55.00	53.00
321	34.00	44.50	45.50
347	38.50	48.50	50.00

STRAIGHT CHROMIUM STEELS

410	23.00	27.00	33.00
416	23.50	33.50	33.50
420	28.50	43.50	40.50
430	23.50	27.50	35.50
442	27.00	39.00	39.50
446	32.50	60.00	50.00

STAINLESS-CLAD STEELS

	Plates —Cladding— 10%	Plates —Cladding— 20%	Sheets —Cladding— 10%	Sheets —Cladding— 20%
302	....	....	19.75	21.50
304	22.50	26.50	20.75	22.50
310	32.50	36.50	....	....
316	27.00	31.00	26.00	28.00
321	23.50	27.50	....	....
347	25.00	29.00	24.00	26.00
405	18.75	24.75	....	....
410	18.25	24.25	....	....
430	18.25	24.25	....	....

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

For prices bolts, nuts, rivets and washers please refer to July 25 issue, Page 115.

Tubular Goods

Standard Steel Pipe: Eastern mill carlot prices, threaded and coupled, to consumers about $200 a net ton. Discounts from base:

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	39½– 41½	11– 13½	1	46½– 48½	30½– 33½
¼	37½– 39½	13– 15½	1¼	47– 49	31– 34
⅜	34– 36	9½– 12½	1½	47½– 49½	31½– 34½
½	41– 43	23½– 26½	2	48– 50	32– 35
¾	44– 46	27½– 30½	2½, 3	48½– 50½	32½– 35½
			3½ & 4	44½	29

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	40½	25	38½	23	28– 38½	12½– 23
2½	44½	29	41½	26	33½– 41½	18– 26
3	44½	29	41½	26	36– 41½	20½ 26
3½&4	42½– 46½	26– 31	43½	28	38½– 43½	23– 28
5 & 6	42½– 44½	26– 29	43½	28	43½	28
7	....	....	....	....	43½	27

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	40½	12½	1¼	46– 48	32– 33
¼	38½	14½			
⅜	35	11½	1½	46½– 48½	32½– 33½
½	40– 42	24½– 25½	2	47– 49	33– 34
¾	43– 45	28½– 29½	2½ & 3	47½– 49½	33½– 34½
1	45½– 47½	31½– 32½	3½ & 4	43½	28

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	39½	24	37½	22	27– 37½	11½– 22
2½	43½	28	40½	25	32½– 40½	17– 25
3	43½	28	40½	25	35– 40½	19½– 25
3½-4	41½– 45½	28½– 30	42½	27	37½– 42½	22– 27
5 & 6	41½– 43½	28– 28½	42½	27	42½	27
8	45½	29	44½	28	44½	28
10	45	28½	44	27½	44	27½
12	44	27½	43	26½	43	26½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Blk. Butt Weld	Gal. Butt Weld	In.	Lap Weld Blk.	Lap Weld Gal.
⅜	+59	+90	1¼	+22	+47½
½	+20	+47	1½	+15½	+44
¾	+10	+36	2	+ 7½	+31
1 and 1¼	+ 4	+27	2½-3	+ 5	+26½
1½	— 2	+23½	4	List	+20½
2	— 2½	+23	4½-8	+ 2	+22
			9-12	+12	+31½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24", inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	11.50	13.39	13.00	13.00
1¼	13	13.62	15.87	13 21	15.39
1½	13	15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2½	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Pipe Cast Iron: Class B, 6-in. and over, $82.50-$93.50 per net ton, Birmingham; $87.50, Burlington, N. J.; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb mill, except: $3.30, Minnequa, Colo.
Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.
Light (rail steel): $3.55 per 100 lb, Williamsport, Pa., Huntington, W. Va.
Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.
Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.
Splice Bars: 4.25c, mill.
Standard Spikes: 5.35c, mill.
Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Birmingham, furnace	38.88	39.38	....	....
Cincinnati, del.	....	45.43	....	....
Buffalo, furnace	46.00	46.50	47.00	....
Boston, del.	54.92	55.42	55.92	....
Rochester, del.	47.95	48.45	48.95	....
Syracuse, del.	49.39	49.89	50.39	....
§**Chicago,** district furnaces	46.00	46.50	46.50	47.00
Milwaukee, del.	47.82	48.32	48.32	48.82
Muskegon, Mich., del.	....	51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Duluth, furnace	....	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	50.00	50.50	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65*	49.15*	49.65*	....
Ironton, Utah, furnace	46.00	46.50	....	....
Lone Star, Tex., furnace	46.00	†46.50	....	....
Gulf ports, del.	50.50	51.00	....	....
‡**Neville Island, Pa.,** furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	46.00	....	....	....
Swedeland, Pa., furnace	48.00	48.50	49.00	49.50
Philadelphia, del.	49.39	49.89	50.39	50.89
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Troy, N. Y., furnace	48.00	48.50	49.00	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

* Including 3 per cent federal transportation tax.
† Low phosphorus southern grade.
‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.
§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)..$59.50
6.51-7.00.. 60.50 9.01- 9.50. 65.50
7.01-7.50.. 61.50 9.51-10.00. 66.50
7.51-8.00.. 62.50 10.01-10.50. 67.50
8.01-8.50.. 63.50 10.51-11.00. 68.50
8.51-9.00.. 64.50 11.01-11.50. 69.50
F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.50 furnace, Niagara Falls; $80 open-hearth and foundry grade, Keokuk, Iowa, or Wenatchee, Wash., freight allowed to normal trade area. 12½ lb piglets, $85, Keokuk, Iowa, freight allowed to normal trade area. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. P.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn. ....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $56.9786 del. Intermediate phosphorus, Central Furnaces, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Inches Diam.	Length	Cents per lb. f.o.b. plant
Graphite		
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
8	48, 60	19.00
4, 5½	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
Carbon		
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens	
Connellsville, furnace	$13.00-13.50
Connellsville, foundry	15.50-16.00
New River, foundry	18.00
Wise county, foundry	15.35
Wise county, furnace	14.60
Oven Foundry Coke	
Kearney, N. J., ovens	$22.00
Everett, Mass., ovens	
New England, del.‡	22.70
Chicago, ovens	20.00
Chicago, del.	†21.45
Detroit, del.	23.76
Terre Haute, ovens	20.20
Milwaukee, ovens	20.75
Indianapolis, ovens	19.85
Chicago, del.	23.19
Cincinnati, del.	22.66
Detroit, del.	23.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del	22.70
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens	20.40
Portsmouth, O., ovens	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.90
Flint, del.	21.98
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡ Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens (Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	19.00-23.50
Industrial xylol	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia	$45.00
Per pound, ovens (Effective June 1, 1949)	
Phenol, 40 (carlots, returnable drums)	13.25
Do., less than carlots	14.00
Do., tank cars	12.50
(Effective Oct. 25, 1948)	
Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.) Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)
Domestic dead-burned, ⅜" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton)
Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural)
Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.62% concentrates, contract	16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
Brazil iron ore, 68-69%	19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

Long term contracts, involving large tonnages, prices are nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. United States ports; prices on lower grades adjusted to manganese content and impurities.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines	$0.90

WAREHOUSE STEEL PRICES

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga. and Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.80‡	6.51	7.10	5.82	...	5.77	6.56	8.28	5.53	5.85	7.36
New York(c'try)	5.60‡	6.31	6.90	5.62	...	5.57	6.36	8.08	5.33	5.65	7.16
Boston (city) ..	5.70	6.70**	7.11	5.75	...	5.67	6.42	8.72	5.57	5.90	7.40
Boston (c'try) .	5.55	6.55**	6.96	5.60	...	5.52	6.27	8.57	5.42	5.75	7.25
Phila. (city)...	5.80	6.39	6.78	5.55	...	5.55	6.09	8.00	5.25	5.50	6.70
Phila. (c'try) ..	5.65	6.24	6.63	5.40	...	5.40	5.94	7.85	5.10	5.35	6.55
Balt. (city)....	5.46	6.36	6.81	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31	6.21	6.66	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)..	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)..	4.85	5.75‖*	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse)	5.32	6.22‖*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.80-6.85	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse).	4.85	5.75	6.65-6.70	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse).	5.26‡	5.94**	6.83	5.38	6.10	5.43	5.94	...	5.43	5.63	7.03
Chicago (city) .	5.00-5.20‡	5.90[4]	7.00	5.00	6.67-6.83	5.05	5.60	7.85[5]	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05‡	5.75[4]	6.85	4.85	6.52-6.68	4.90	5.40	7.70[5]	4.90	5.10	6.55
Milwaukee(city)	5.18-5.38‡	6.08[4]	7.18	5.18	6.82-7.01	5.23	5.78	8.03[5]	5.23	5.43	6.88
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse)..	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham(c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	6.60	8.05**	7.95	6.80	9.50	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse)..	6.45	7.90**	7.80	6.65	9.35	6.10	8.05	...	5.95	6.15	8.05
San Francisco..	6.15[10]	7.50[3]	8.10	6.75[10]	8.25[8]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma.	6.70[7]‡	8.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.35	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 17 gage; †† as annealed.

Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 9999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499lb.

PRICES OF LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, carload, lump, bulk, max, 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90-21.70c; ton lot 21.00-22.60c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.) C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

For prices of other ferroalloy products please refer to July 25 issue, Page 138.

Metal Prices Continue To Rise

Lead and zinc advance ½-cent a pound as consumers take large tonnages to replenish inventories and prepare for more active operations. Copper prices remain firm

New York — Nonferrous metal prices rose further last week on continued active demand. Advances of ½-cent a pound in lead, made in two ¼-cent steps, and of ½-cent in zinc constitute further evidence that a new market cycle is well under way. Strength in nonferrous metal markets is reflected also in copper which remains firm at the 17.62½-cent level.

Basis for the renewed strength lies in a combination of factors. Operations in many metalworking industries did not drop as low in July as had been expected and signs of a seasonal upturn have appeared sooner. Reductions in inventories of raw materials were correspondingly too severe and, when large numbers of consumers re-entered the markets to replenish them, available supplies had shrunk as a result of low prices and labor difficulties at mines.

Copper—Consumption of copper by fabricators increased 9533 tons during June to 70,916 tons from 61,383 tons in May. This gain was larger than had been expected. Total stocks of copper held by fabricators declined to 341,521 tons at the end of June from 367,034 tons at the end of the preceding month. Visible supplies were reduced 25,898 tons to a total of 63,744 tons. Bulk of this drop was due to an increase of 26,205 tons in consumption over receipts from mills which totaled 44,711 tons compared with 32,566 tons in May.

Fabricators' order backlogs have been reduced steadily since the beginning of this year when they totaled 315,944 tons compared with the June 30 total of only 180,092 tons. Fabricators have a deficit of 89,970 tons in stocks and purchases compared with their order backlog.

Leading producers of brass mill products have adjusted their prices to the higher quotations on lead and zinc. Several of the producers also have announced quantity schedule revisions.

Lead—Prices advanced ¼-cent a pound July 25 and another ¼-cent July 27, common lead now being quoted 14.30c to 14.35c, St. Louis. The latest advance was the fifth in July and brought the total increase to 2½ cents since the start of the uptrend on July 8. In eight successive declines, the market had dropped 9½ cents from the record high which held during November, 1948, through early March.

Sales at the new level continued satisfactory, although bulk of the business is being done on an average price basis. With most sellers booked well into August, consumers wishing to buy on a flat price basis generally are placed on a waiting list. The revived demand for lead, which now has lasted about two months, is coming principally from storage battery makers, sheet lead and cable makers and solder manufacturers.

Producers of lead products and oxides have advanced their prices in line with the higher quotations in the primary lead market.

Lead users in this country again are paying slight premiums for metal of foreign origin where prompt or nearby shipment is desired. Sales of Yugoslavian and German lead were reported last week at 14.50c, duty paid New York.

The improvement in the lead market is supported by a stronger statistical position of the industry as revealed in the June statistics. Shipments during that month rose sharply to 30,017 tons from only 19,792 tons in May and 16,743 tons in April, the all-time low. Total shipments in the first six months amounted to 187,012 tons compared with 290,526 tons in the like 1948 period. Shipments in net tons to the various industrial classifications of users in June and May, respectively were: Cable, 6116 and 2960; batteries, 4703 and 4190; sundries, 2242 and 2744; unclassified (going mainly into white lead, red lead, litharge and other oxides; and into sheet and pipe), 19,431 and 9578.

Production of refined lead declined about 5200 tons in June to 46,429 tons. Total output for the first six months amounted to 297,546 tons, or a decline of about 44,500 tons from the like 1948 period.

Stocks of lead at refineries at the close of June were up about 6000 tons to 100,117 tons.

Production of antimonial lead in June increased to 4149 tons from 1405 tons in May, bringing the total for the first half to 28,770 tons compared with 56,912 tons in the corresponding period a year ago. Stocks of antimonial lead at the end of June amounted to 12,414 tons, against 10,545 tons at the end of the preceding month.

Zinc—Prices rose ½-cent a pound on July 25 to the basis of 10.00c a pound, East St. Louis. This was the second advance in July, returning the market to the level that prevailed on June 8 but leaving it well below the first-quarter peak of 17.50c.

Chief support of the market at the higher level is the galvanizing industry which again placed larger orders last week. Die casters also were active in the market, while the operators of brass mills took only fair tonnages. Consensus in the trade is that the latter industry will enter the market soon for substantial tonnages in view of their depleted inventories and the stepup in their operations.

Tin—Reconstruction Finance Corp. continues to delay in making any purchases of pig tin against the first interim allocation of 17,100 tons to the United States for the second half of the year. This is not seen as a threat to consuming industries, however, since stocks are adequate for nearby needs.

International Tin Study Group at The Hague estimates world mine production of tin in May at 12,800 tons compared with 12,900 tons in April. Total production for the first five months came to 62,100 tons compared with 60,200 tons in the like 1948 period. World smelter production of refined tin in May is estimated at 14,700 tons, making a total of 69,400 tons for the first five months against about 60,000 tons during the like 1948 period.

New Copper Futures Contract

New York—A new copper contract for futures trading on the Commodity Exchange Inc. has been approved by the board of governors. The necessary changes in the by-laws will be voted upon by the membership of the Exchange.

One important feature of the new contract is the lifting of the premium on the delivery of electrolytic refined copper to 2 cents a pound above the contract basis from the 1-cent a pound differential of the old copper contract.

The new contract, recommended by the Exchange's metal trade group, also will increase the grade of copper for the deliverable contract basis. It makes copper assaying 99 per cent to 99.24 per cent the basis deliverable grade instead of a lower grade rough blister copper in the current futures contract.

Removes Tin Plate Quotas

Washington — Limitations on the amount of terne plate and tin plate an exporter may ship in the fourth quarter of this year have been removed by the Office of International Trade, Department of Commerce.

Increased domestic supplies of tin mill products allow the definite tonnage quotas for these two materials to be dropped, effective Oct. 1, OIT said.

Exports of tin plate and terne plate previously had been under specific quotas. A tin plate quota of 145,000 tons was allowed in the third quarter of this year, while a terne plate quota of 700 tons was set. Exporters of these products must continue to secure validated licenses from OIT and observe all other applicable export regulations. These license applications will be screened by OIT for excessive quantities, as well as for end-uses.

Remelt Aluminum Output Dips

Washington—Aluminum ingot output at secondary smelters totaled 10,889 short tons in February, a decline of 22 per cent from the 14,041 tons produced in January, according to the Bureau of Mines. Total aluminum scrap consumption declined 25 per cent to 11,481 tons in February, the smallest since September, 1945. Total scrap inventories declined 4 per cent from Jan. 31, as a 21 per cent increase in plant scrap stocks was exceeded by a decline of 23 per cent in stocks of obsolete scrap.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic 17.62½c, Conn. Valley; Lake, 17.75c., Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 14.25-16.00c; 88-10-2 (No. 215) 24.00c; 80-10-10 (No. 305) 20.50c; No. 1 yellow (No. 405) 12.00-13.75c.

Zinc: Prime western 10.00c, brass special 10.25c, intermediate 10.50c, East St. Louis; high grade 11.00c, delivered.

Lead: Common 14.30-14.35c; chemical, 14.40c; corroding, 14.30-14.45c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 15.50-15.75c; No. 12 foundry alloy (No. 2 grade) 14.50-15.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 15.50-15.75c; grade 2, 14.75-15.25c; grade 3, 13.75-14.25c; grade 4, 13.00-13.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $78-$81 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 71.50c per ounce.

Platinum: $69-$72 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

Sheet: Copper 31.30; yellow brass 28.19; commercial bronze, 95%, 31.28; 90%, 30.84; red brass, 85%, 29.89; 80%, 29.47; best quality, 29.01; nickel silver, 18%, 41.78; phosphor-bronze, grade A, 5%, 50.47.

Rods: Copper, hot rolled 27.15; cold drawn 28.40; yellow brass free cutting, 22.76; commercial bronze, 95% 30.97; 90% 30.53; red brass 85% 29.58; 80% 29.16.

Seamless Tubing: Copper 31.34, yellow brass 31.20; commercial bronze 90% 33.50; red brass 85% 32.80; 80% 32.38.

Wire: Yellow brass 28.48; commercial bronze, 95% 31.57; 90% 31.13; red brass, 85% 30.18; 80% 29.76; best quality brass 29.30.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots, 23.42½, l.c.l. 24.05, c.l. 23.55; weatherproof, f.o.b. eastern mills, 100,000 lb lots, 25.193, l.c.l. 25.943, c.l. 25.443; magnet, delivered, c.l. 27.62½, 15,000 lb or more 27.87½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	24.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Hexagonal— R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	..	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $19.50 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $19.50 per cwt. Traps and Bends: List price plus 53%.

ZINC

Sheets, 14.50-15.00c f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 14.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 13.00c; over 12-in., 14.00c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
June Avg.	16.606	11.850	9.548	103.000	17.000	38.500	40.000	71.500
May Avg..	18.045	13.566	11.880	103.000	17.000	38.500	40.000	71.500
Apr. Avg..	21.774	15.017	14.085	103.000	17.000	38.500	40.000	71.500
July 1-5..	16.00	11.85	9.00	103.00	17.00	38.50	40.00	71.50
July 6-7..	17.00	11.85	9.00	103.00	17.00	38.50	40.00	71.50
July 8-9..	17.00	12.85	9.00	103.00	17.00	38.50	40.00	71.50
July 11...	17.62½	12.85	9.00	103.00	17.00	38.50	40.00	71.50
July 12...	17.62½	13.35	9.00	103.00	17.00	38.50	40.00	71.50
July 13-16	17.62½	13.80-13.85	9.00	103.00	17.00	38.50	40.00	71.50
July 18-23	17.62½	13.80-13.85	9.50	103.00	17.00	38.50	40.00	71.50
July 25-26	17.62½	14.05-14.10	10.00	103.00	17.00	38.50	40.00	71.50
July 27-28	17.62½	14.30-14.35	10.00	103.00	17.00	38.50	40.00	71.50

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 27.96c; oval 27.46c; cast 25.99c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 97.00c; 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	12.00	11.75	11.00
Commercial Bronze			
95%	13.62½	13.37½	12.87½
90%	13.50	13.25	12.75
Red Brass			
85%	13.25	13.00	13.12½
80%	13.00	12.75	12.25
Best Quality (71-80%)	12.87½	12.62½	12.12½
Muntz Metal	11.12½	10.87½	10.37½
Nickel, silver, 10%	14.00	13.75	7.00
Phos. bronze, A	16.37½	16.12½	15.12½
Naval brass	11.62½	11.37½	10.87½
Manganese bronze	11.62½	11.37½	10.75

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 13.75-14.00, No. 2 copper 12.75, light copper 11.75, composition red brass 10.00-10.25; radiators 8.75, heavy yellow brass 8.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 13.75-14.00, No. 2 copper 12.75-13.00, light copper 11.75-12.00, refinery brass (60% copper) per dry copper content 11.00-11.25.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.00-12.25, No. 2 11.00-11.25, light copper 9.75-10.25, No. 1 composition red brass 8.50-8.75, No. 1 composition turnings 8.25-8.50, mixed brass turnings 5.25-5.50, new brass clippings 9.75-10.25, No. 1 brass rod turnings 7.25-7.50, light brass 5.25-5.50, heavy yellow brass 5.75-6.00, new brass rod ends 7.25-7.50, auto radiators, unsweated 7.00-7.25, cocks and faucets, 7.00-7.25, brass pipe 7.00-7.25.

Lead: Heavy 10.50-11.00, battery plates 6.25-6.50, linotype and stereotype 11.25-11.50, electrotype 10.00-10.50, mixed babbitt 11.25-11.75, solder joints, 13.50-14.00.

Zinc: Old zinc 4.00-4.50, new die cast scrap 3.50-4.00, old die cast scrap 2.50.

Tin: No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00.

Aluminum: Clippings 2S 9.50-10.00, old sheets 5.50-6.00, crankcase 5.50-6.00, borings and turnings 3.00-3.50, pistons, free of struts, 5.50-6.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt.	$21.00
No. 2 Heavy Melt.	19.00*
No. 1 Busheling	21.00
No. 1 Bundles	21.00
No. 2 Bundles	17.00-17.50*
No. 3 Bundles	16.50-17.00*
Heavy Turnings	16.50-17.00*
Machine Shop Turnings	13.00-13.50
Mixed Borings, Turnings	13.00-13.50
Short Shovel Turnings	16.00
Cast Iron Borings	16.00-17.00
Bar Crops and Plate	21.00-21.50
Low Phos. Steel	23.00-23.50

Cast Iron Grades†

No. 1 Cupola Cast	22.00-23.00
No. 1 Machinery Cast	27.00-28.00
Charging Box Cast	21.00-21.50
Heavy Breakable Cast	18.50-19.50
Brake Shoe	21.50-22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.00-22.00
Axles	23.50-24.00
Rails, Random Lengths	22.00-22.50‡
Rails, 2 ft and under	26.50-27.00
Rails, 18 in. and under	27.00-27.50
Railroad Specialties	23.00-23.50
Angles, Splice Bars	23.00-23.50

*Nominal.
‡Brokers' buying prices.
†Crushers' buying prices.

CLEVELAND

Heavy Melt. Steel	$14.50-15.50
No. 1 Busheling	14.50-15.50
No. 2 Bundles	12.50-13.50
Machine Shop Turnings	8.50-9.50
Mixed Borings, Turnings	14.00-14.50
Short Shovel Turnings	14.00-14.50
Heavy Turnings	19.00
Cast Iron Borings	14.00-14.50
Bar Crops and Plate	16.00-17.00
Punchings & Plate Scrap	15.00-17.00
Cut Structurals	17.00-18.00

Cast Iron Grades†

No. 1 Cupola	28.00-30.00
Charging Box Cast	23.00-24.00
Stove Plate	24.00-25.00
Heavy Breakable Cast	21.00-22.00
Unstripped Motor Blocks	19.50-20.00
Malleable	23.00-24.00
Brake Shoes	20.00-21.00
Clean Auto Cast	31.00-32.00
No. 1 Wheels	24.00-25.00
Burnt Cast	21.00-22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.00-22.00
R.R. Malleable	23.00-24.00
Rails, 3 ft and under	27.00-28.00
Rails, Random Lengths	24.00-25.00
Cast Steel	22.50-23.50
Railroad Specialties	22.50-23.50
Uncut Tires	24.00
Angles, Splice Bars	26.00

† Nominal.

VALLEY

Heavy Melt. Steel	$18.50
No. 1 Bundles	18.50
No. 2 Bundles	15.50
Machine Shop Turnings	10.00-10.50
Short Shovel Turnings	16.00-17.00
Cast Iron Borings	16.00-17.00
Low Phos.	19.50-20.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.50-21.00

MANSFIELD

Machine Shop Turnings	$10.00-10.50
Short Shovel Turnings	14.00-14.50

CINCINNATI

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	17.00
No. 1 Bundles	18.00
No. 2 Bundles	16.00
Machine Shop Turnings	8.00
Mixed Borings, Turnings	8.00
Short Shovel Turnings	8.00
Cast Iron Borings	9.00

Cast Iron Grades

No. 1 Cupola Cast	27.00
Charging Box Cast	21.00
Heavy Breakable Cast	18.00
Stove Plate	15.00
Unstripped Motor Blocks	15.00
Brake Shoes	15.00
Clean Auto Cast	27.00
Drop Broken Cast	32.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
R.R. Malleable	19.00
Rails, Rerolling	21.00
Rails, Random Lengths	19.00
Rails, 18 in. and under	30.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 Bundles	$14.50-15.00
No. 2 Bundles	11.00-11.50
No. 2 Heavy Melt. Steel	11.50-12.00
No. 1 Busheling	14.50-15.00
Machine Shop Turnings	8.00-8.50
Mixed Borings, Turnings	8.00-8.50
Short Shovel Turnings	9.50-10.00
Cast Iron Borings	9.50-10.00
Punchings & Plate Scrap	14.50-15.00

Cast Iron Grades

No. 1 Cupola Cast	21.00-22.00
Heavy Breakable Cast	17.00-18.00
Clean Auto Cast	21.00-22.00

BUFFALO

No. 1 Heavy Melt. Steel	$20.00-20.50
No. 2 Heavy Melt. Steel	17.00-17.50
No. 1 Bundles	17.00-17.50
No. 1 Bushelings	17.00-17.50
No. 2 Bundles	15.00-15.50
Machine Shop Turnings	11.50-12.00
Mixed Borings, Turnings	14.50-15.00
Cast Iron Borings	14.50-15.00
Short Shovelings	15.00-16.00
Low Phos.	21.00-22.00

Cast Iron Grades

No. 1 Cupola	25.00-26.00
Mixed Yard	24.00-25.00
Heavy Breakable	22.00-23.00
Malleable	23.00-24.00
Clean Auto Cast	23.50-24.00

Railroad Scrap

Rails 3 ft. and under	26.00-27.00
Scrap Rails	23.00-24.00
Specialties	22.50-24.50

PHILADELPHIA

No. 1 Heavy Melt. Steel	$17.50
No. 2 Heavy Melt. Steel	16.50
No. 1 Busheling	17.50
No. 1 Bundles	17.50
No. 2 Bundles	15.00-15.50
Machine Shop Turnings	11.50-12.00
Short Shovel Turnings	13.00-13.50
Mixed Borings, Turnings	11.50-12.00
Bar Crop and Plate	20.00-21.00
Punchings & Plate Scrap	21.00-22.00
Cut Structurals	20.00-21.00
Elec. Furnace Bundles	18.50
Heavy Turnings	17.50
No. 1 Chemical Borings	16.00-17.00

Cast Iron Grades

No. 1 Cupola Cast	25.00
No. 1 Machinery Cast	26.00-27.00
Charging Box Cast	23.00-24.00
Heavy Breakable Cast	23.00-24.00
Unstripped Motor Blocks	18.00-19.00
Clean Auto Cast	26.00-27.00
No. 1 Wheels	27.00-28.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$13.00-13.50
No. 2 Heavy Melt. Steel	12.00-12.50
No. 1 Busheling	12.00-12.50
No. 1 Bundles	13.00-13.50
No. 2 Bundles	11.00-11.50
No. 3 Bundles	nominal
Machine Shop Turnings	4.00-4.50
Mixed Borings, Turnings	4.00-4.50
Short Shovel Turnings	5.00-6.00
Punchings & Plate Scrap	15.00
Cut Structurals	nominal
Elec. Furnace Bundles	17.00

Cast Iron Grades

No. 1 Cupola Cast	19.00-20.00
No. 1 Machinery	20.00-21.00
Charging Box Cast	17.00-17.50
Heavy Breakable	17.00-17.50
Unstripped Motor Blocks	nom.
Malleable	nom.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$9.50
No. 2 Heavy Melt. Steel	8.50-9.00
No. 1 Bundles	9.50
No. 1 Busheling	8.00-8.50
Machine Shop Turnings	5.00-5.50
Mixed Borings, Turnings	4.50-5.00
Short Shovel Turnings	6.00-6.50
Bar Crops and Plate	11.00-12.00
Punchings & Plate Scrap	11.00-12.00
Chemical Borings	10.50-11.00

Cast Iron Grades

No. 1 Cupola Cast	19.00-20.00
Mixed Cast	18.00-19.00
Heavy Breakable Cast	17.00-18.00
Stove Plate	18.00-19.00
Unstripped Motor Blocks	16.00-17.00

CHICAGO

No. 1 Heavy Melt. Steel	$19.00-20.00
No. 2 Heavy Melt. Steel	17.00-18.00
No. 1 Bundles	19.00-20.00
No. 2 Bundles	15.00-16.00
No. 3 Bundles	12.00-13.00†
Machine Shop Turnings	11.00-12.00
Mixed Borings, Turnings	9.00-10.00
Short Shovel Turnings	13.00-14.00
Cast Iron Borings	12.00-13.00
Bar Crops and Plate	19.00-20.00†
Punchings	19.00-20.00†
Elec. Furnace Bundles	19.00-20.00†
Heavy Turnings	17.00-18.00
Cut Structurals	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast	29.00-30.00
Clean Auto Cast	28.00-29.00
No. 1 Wheels	27.00-28.00

Railroad Scrap

No. 1 R.R. Heavy Melt	20.00-21.00
Malleable	22.00-23.00†
Rails, Rerolling	27.50-28.00
Rails, Random Lengths	22.00-23.00
Rails, 2 ft. and under	28.00-29.00
Rails, 18 in. and under	29.00-30.00
Railroad Specialties	23.00-24.00
Angles, Splice Bars	23.00-24.00

†Nominal

ST. LOUIS

No. 1 Heavy Melt, Steel	$18.00-19.00
No. 2 Heavy Melt. Steel	17.00-18.00
Machine Shop Turnings	9.00-11.00
Short Shovel Turnings	9.00-11.00

Cast Iron Grades

No. 1 Cupola Cast	24.00-25.00
Charging Box Cast	20.00-22.00
Heavy Breakable Cast	19.00-20.00
Brake Shoes	19.00-20.00
Clean Auto Cast	28.00-29.00
Burnt Cast	20.00-21.00

Railroad Scrap

R. R. Malleable	19.00-20.00
Rails, Rerolling	25.00-26.00
Rails, Random Lengths	21.00-22.00
Rails, 3 ft. and under	25.00-26.00
Uncut Tires	18.00-19.00
Angles, Splice Bars	24.00-25.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	16.00
No. 1 Busheling	16.00
No. 2 Bundles	14.00
Machine Shop Turnings	13.00
Mixed Borings, Turnings	14.00
Short Shovel Turnings	15.00
Cast Iron Borings	15.00
Bar Crops and Plate	23.00
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast	28.00
Stove Plate	20.00
No. 1 Wheels	17.00-18.00

STEELMAKING SCRAP COMPOSITE

July 30	$19.34
July 23	19.17
June 1949	20.85
July 1948	41.43
July 1944	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00-21.00
R.R. Malleable	nominal
Rails, Rerolling	22.50-23.00
Rails, 3 ft. and under	23.00-24.00
Angles and Splice Bars	22.00-23.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
Machine Shop Turnings	12.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Wheels	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Bushelings	15.00
Nos. 1 & 2 Bundles	15.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	22.00-25.00
Cut Structurals	22.00-25.00
Elec. Furnace Bundles	25.00

Cast Iron Grades

No. 1 Cupola Cast	20.00-23.00
Heavy Breakable Cast	17.00
Stove Plate	17.00
Unstripped Motor Blocks	17.00
Malleable	20.00
Brake Shoes	23.00
Clean Auto Cast	25.00
No. 1 Wheels	22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	18.00
Railroad Malleable	22.00
Rails, Random Lengths	18.00
Angles and Splice Bars	18.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	26.00
Electric Furnace Bundles	20.00

Cast Iron Grades

No. 1 Cupola Cast	27.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.00
Rails, Rerolling	22.50

HAMILTON, ONT.

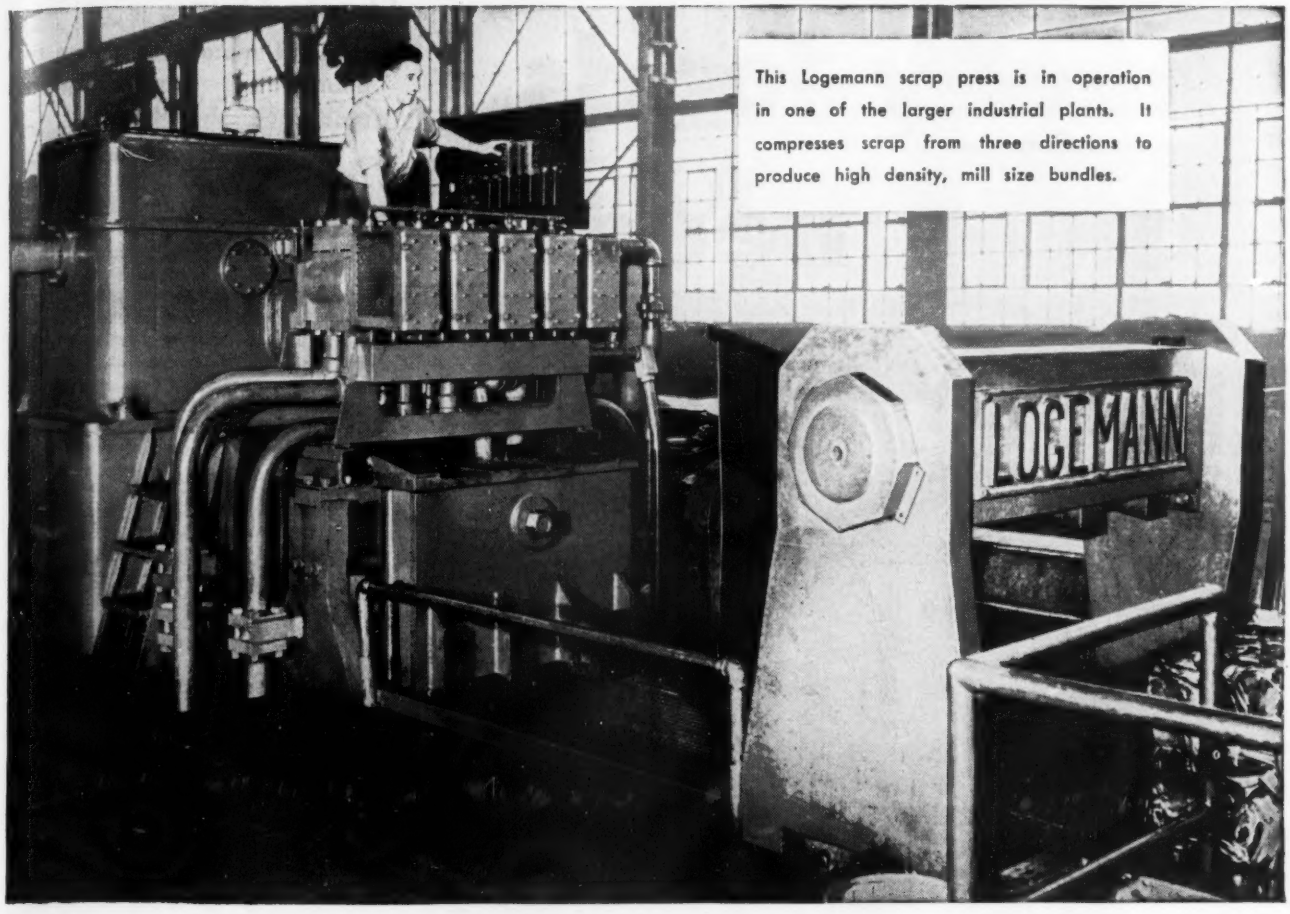
(Ceiling prices, delivered)

Heavy Melt.	$21.00
No. 1 Bundles	21.00
Mechanical Bundles	19.00
Mixed Steel Scrap	17.00
Mixed Borings, Turnings	15.00
Rails, Remelting	21.00
Rails, Rerolling	24.00
Bushelings	15.00
Bushelings, new factory, prep'd	19.00
Bushelings, new factory, unprep'd	14.00
Short Steel Turnings	15.00

Cast Iron Grades*

Cast	26.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

Self-contained.....
Triple Compression..
Automatically Controlled

LOGEMANN SCRAP PRESSES

handle high tonnages with minimum labor . . . at low cost!

LOGEMANN METAL BALERS

. . . are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

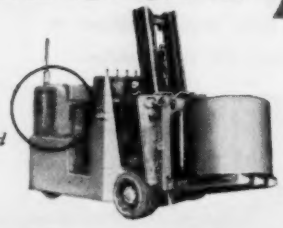
The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is *no need for specially-trained maintenance crews.*

Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information—please state the nature of your scrap and tonnage.

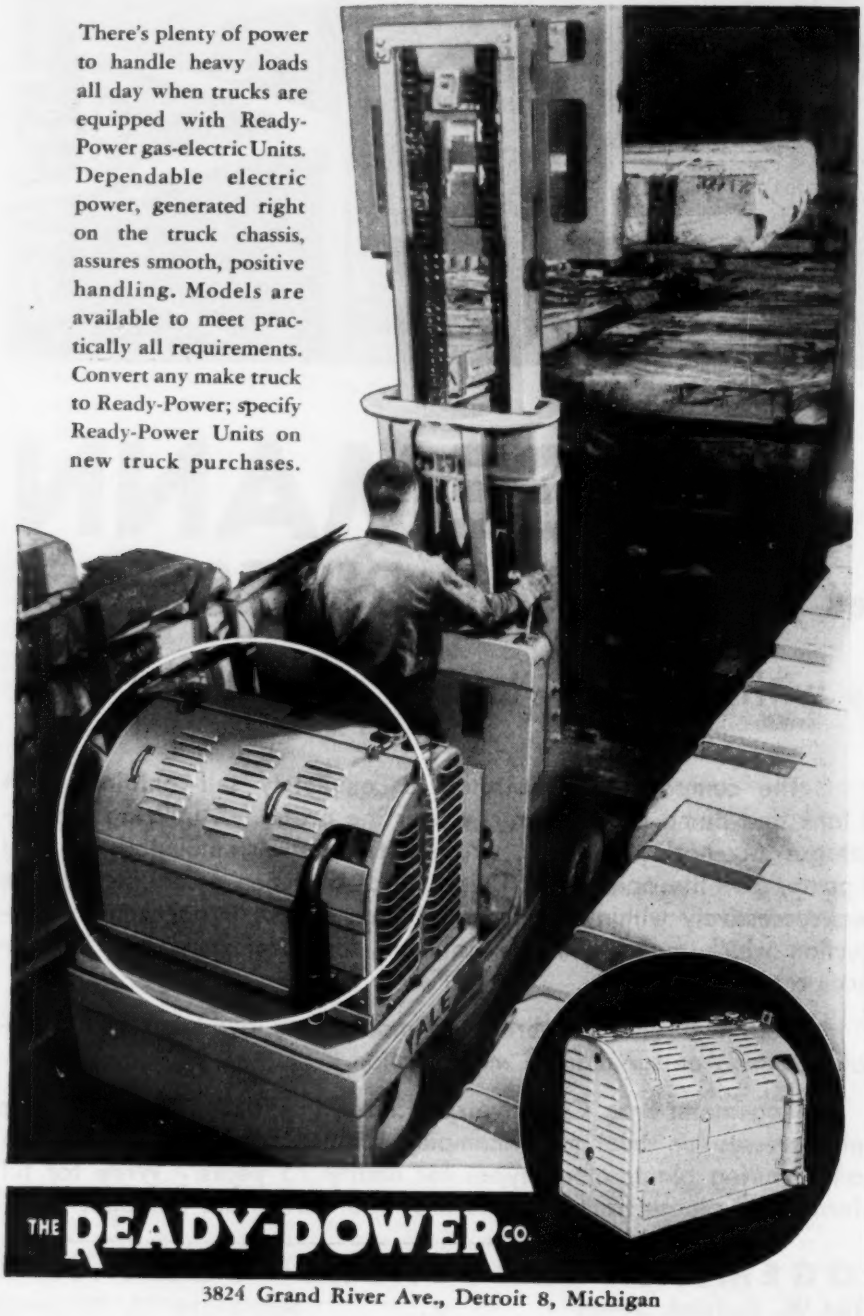
LOGEMANN BROTHERS COMPANY
3164 W. Burleigh Street • Milwaukee 10, Wisconsin

heavy loads need READY-POWER



Ready-Power-equipped Baker truck

There's plenty of power to handle heavy loads all day when trucks are equipped with Ready-Power gas-electric Units. Dependable electric power, generated right on the truck chassis, assures smooth, positive handling. Models are available to meet practically all requirements. Convert any make truck to Ready-Power; specify Ready-Power Units on new truck purchases.



THE READY-POWER CO.

3824 Grand River Ave., Detroit 8, Michigan

Sheets, Strip . . .

Demand improves as home appliance and farm equipment production schedules rise

Sheet Prices, Page 122

New York—A modest spurt in sheet demand has developed. The most active inquiry in several weeks is ascribed in part to resumption of operations at a number of plants after suspensions for vacations and to the fact that inventories are at a point where new buying is highly desirable. There is less concern, at least temporarily, over the price outlook. A number of buyers, who until recently looked for lower prices by early August, now expect no immediate change. They look for steadiness in prices until the wage controversy is settled and this may involve another several weeks.

Some leading producers are booked up solidly throughout the remainder of this quarter on practically all grades of sheets, the exceptions being on certain specialties, particularly stainless and electrical sheets. Supply of coated sheets is especially tight, due primarily to grain bin allotments. Increasing stringency also is noted in the wider sizes of cold-finished sheets with improved demand for household accessories augmenting continued heavy specifications from automobile manufacturers. One large eastern manufacturer of washing machines is now operating at 90 per cent of capacity, representing a sharp increase in the rate of a few weeks ago. Lower prices for the finished product has stimulated demand, it is pointed out.

Pittsburgh—Quickening in demand for flat-rolled steel products from home appliance and farm implement manufacturers has developed, but major support still is from the automotive industry. Sheet sellers, however, are apprehensive of a fall slump in auto demand which would jolt the sheet and strip markets severely. The auto trade is expected to take in steel actively as long as the threat of a steel strike exists.

The boost in home appliance manufacturers' production schedules has aroused hopes of a substantial revival in demand from these consumers. In the farm implement trade, buying for the harvest season is opening up and may result in substantial demand for sheets and strip going into lighter farm equipment.

Currently, demand with respect to the various classes of flat-rolled products is mixed. Deliveries generally are improving steadily throughout the list. Galvanized sheets appear in tightest supply. Cold-rolled sheets and strip also are fairly hard to get for early shipment. Enameling sheets are experiencing a slight buying pickup. Hot-rolled sheets and strip and electrical sheets are plentiful.

Boston — Slight, but spotty, improvement in carbon sheet buying points toward lower inventories with more gaps in required sizes and gages. Consumers who have been holding off for possible price adjustments have revised thinking as

MECHANICAL HANDLING SYSTEMS, INC.

REDUCES TRAILER WEIGHT 22%

with J&L OTISCOLOY

HI-TENSILE STEEL SHEETS

J&L STEEL

Automobile-transport trailer under construction at Mechanical Handling Systems, Inc., Detroit, Mich. The J&L OTISCOLOY high-strength steel-sheet parts are easily formed and joined.

The high-strength steel trailer ready to get underway. Each automobile is safely cradled on OTISCOLOY sheet-steel tracks.

High-strength steel cuts ton-mile costs for operators of huge automobile transport trailers.

Maximum structural strength, rigidity and fatigue resistance are essential in huge automobile carrier trailers like those built by Mechanical Handling Systems, Inc., of Detroit, Mich. But these characteristics must be obtained with the very minimum of dead weight. Therefore high-strength steel is used almost entirely.

In the trailer illustrated, the use of J&L OTISCOLOY sheet helps to reduce dead weight from 9,000 lbs. to 7,000 lbs.—*a saving of 1 TON, or 22%!*

In many structures, the use of J&L OTISCOLOY reduces dead weight *as much as 35%* without loss of strength, because:

J&L OTISCOLOY

—Has twice the yield strength of mild steel

—Has 50% greater fatigue resistance than carbon steel

—Is resistant to abrasion

—Resists atmospheric corrosion 6 times better than carbon steel

J&L OTISCOLOY can be worked by any standard metal-working method . . . formed hot or cold . . . welded . . . flame-cut. Its ability to hold paint and resist corrosion further widens its applications.

Let us send you a copy of: "OTISCOLOY High-Tensile Steel." Mail the coupon today.

Strip-Sheet Sales Department
Jones & Laughlin Steel Corporation
404 Jones & Laughlin Building
Pittsburgh 19, Pa.

Please send me at once a copy of your booklet: "OTISCOLOY High-Tensile Steel."

NAME_____

COMPANY_____

ADDRESS_____

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

AMERICAN SASH CHAIN

...the "many-purpose" Chain

This **AMERICAN** *chain is known—and widely used—as Sash Chain. But in the many sizes now available, it has hundreds of uses.*

Your AMERICAN CHAIN distributor offers Sash Chain made of Solid Bronze and of Carbon Steel in a selection of finishes. It can also be made of Stainless Steel, of Monel Metal and of Brass. Tensile strengths range from 350 lbs. to 900 lbs. High quality is assured by uniformity of material and precision in fabrication.

Your American Chain distributor is a responsible source for weldless chain made of wire or stampings, electric welded or forge welded chain, a complete line of fittings, attachments and assemblies, cotter pins, hooks, repair links.

BUY AMERICAN—THE COMPLETE CHAIN LINE

ACCO

York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

TRADE MARK

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety

to lower quotations in near future and this is also a factor in placement of some new volume. Orders are still largely for nearby delivery and earliest shipment is frequently basis for placing requirements; lag in forward buying continues and tends to obscure fourth quarter outlook. Most mills are filled through September on cold-rolled, but books hold slim volume for last quarter.

Chicago—Ordering of most sheet and strip products was notably higher last week and producers were undecided whether the surge was an aftermath of the strike scare or whether a new uptrend is starting. Mills with good product mix here feel that operations can be sustained at the present level at least through August. One local producer estimates carryover for galvanized sheets at seven weeks and other sheets at close to a month's production; somewhat more on cold-rolled and less on hot. Sheet requirements of the automotive industry remain high. Inventory replenishment is responsible for a large measure of the present demand upsurge.

Los Angeles—Sheet demand is increasing, with the requirements of some consumers considerably greater than anticipated. One producer is booked through September, and is taking fourth quarter orders. Makers of stoves, steel cabinets, and water heaters, generally have depleted their inventories, and are back in the market. Both demand and prices are easing with regard to stainless, however, for many fabricators have surplus stocks of this item. Depressed demand for stainless, as well as some other alloy specialties, stems in part from the cutback in aircraft procurement.

Cincinnati — Bookings of district sheet mills indicate continued high level of operations through August. Schedules for basic carbon grades are easier to fill than in specialties which require extra sales effort. Some stockpiling of sheets by consumers is being done as insurance against a strike in the industry.

San Francisco—Users and distributors of flat-rolled products are holding off forward buying. With ample inventories of most items, they prefer to fill current special needs on a hand-to-mouth basis and sit tight in hopes of a price reduction this autumn.

Reinforcing Bars . . .

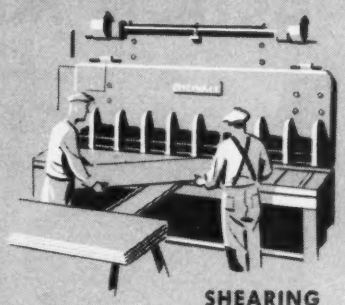
Reinforcing Bar Prices, Page 122

Los Angeles—Demand for reinforcing bars continues fairly strong. Inventories of this material were never large here, and requirements are well maintained by a steady flow of small projects involving 50 to 100 tons.

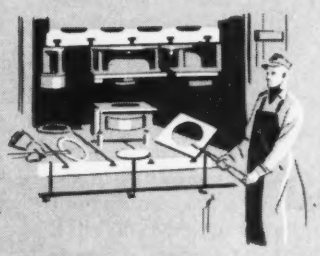
Seattle—Rolling mill operations in this area are below normal, a labor controversy continuing to keep Northwest Steel Rolling Mills Inc.'s plant idle. Bethlehem Pacific Coast Steel Corp. is operating its mills here at top speed. Operators of Portland, Oreg., mills are maintaining capacity production. Demand for reinforcing bars in small tonnages is insistent for highway projects, schools, industrial and commercial construction.

BY-PRODUCTS STEEL CO. GIVES YOU

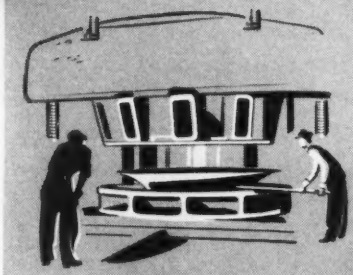
Plate that's shaped to save you time and money



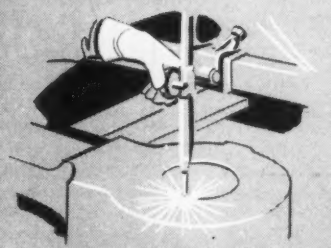
SHEARING



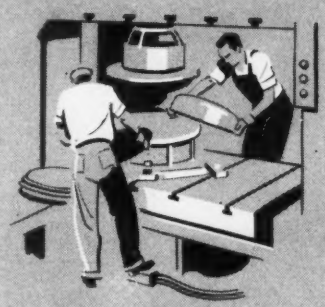
BLANKING



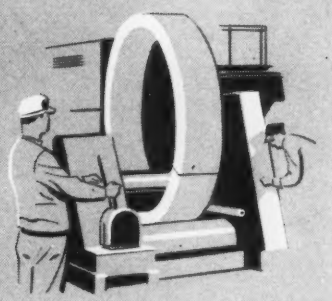
HOT PRESSING



FLAME-CUTTING



COLD PRESSING



BENDING

Your production starts several steps ahead when you buy steel plate products from By-Products Steel Co., saving you time and money. You also save money on scrap, and eliminate freight charges on scrap because trimmings stay at the mill. You pay only for the steel you get.

Often, you avoid having to install heavy cutting and forming equipment to do such work in your own shop. By-Products Steel Co. has over 150 major machines for flame-cutting, shearing, blanking, pressing, bending or otherwise forming plate.

Bulletin 270 shows the wide range of work we do. For a copy, write By-Products Steel Co., Division of Lukens Steel Company, 414 Strode Avenue, Coatesville, Pennsylvania.

★ ★ ★

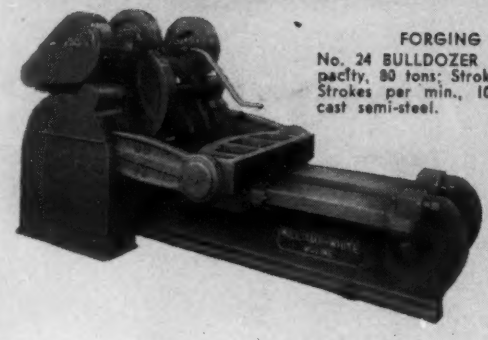
"STEEL SHAPES FOR INDUSTRY", a 16mm motion picture in sound and color showing flame-cutting, bending, shearing, pressing, blanking and otherwise forming steel plate shapes, is available without charge. Running time: 20 minutes. Write for a booking date.

LUKENS

BY-PRODUCTS STEEL DIVISION ★

STEEL PLATE SHAPES FLAME-CUT • SHEARED • BENT PRESSED • BLANKED • WELDED

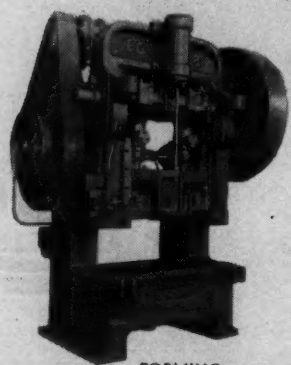
a full line . . .
PRODUCTION MACHINERY



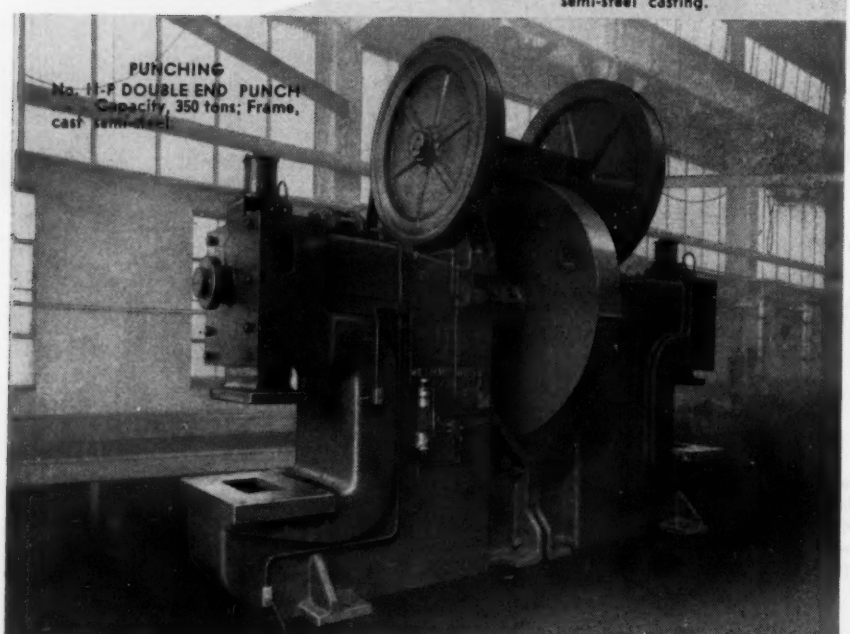
FORGING
No. 24 BULLDOZER . . . Capacity, 80 tons; Stroke, 18 in.; Strokes per min., 10; Frame, cast semi-steel.

BENDING
No. 22 EYEBENDER . . . Capacity 1½" round bar hot on 2" mandrel; ¾" round bar cold on 1¼" mandrel. 12 S.P.M.

The machines shown here are typical of the equipment built by WILLIAMS-WHITE to meet the particular needs of industry. If you are interested in machines similar to the ones illustrated, write us giving as much information as possible and we will send complete specifications.



FORMING
No. 6 G-48 GAP FRAME PRESS . . . Capacity, 125 tons; Strokes per min., 35; Frame, semi-steel casting.



PUNCHING
No. 11-P DOUBLE END PUNCH Capacity, 350 tons; Frame, cast semi-steel

MAKERS OF PRECISION PRODUCTION MACHINERY FOR NEARLY 100 YEARS

WILLIAMS-WHITE & Co.
MOLINE, ILLINOIS

Steel Bars . . .

Bar Prices, Page 122

Pittsburgh—Some slight improvement in inquiry for hot-rolled carbon bars has developed. This reflects the depletion of consumer inventories and the fact that plants are resuming operations following vacation shutdowns. Warehouses also have been showing more interest in their bar needs. In general, however, the market continues in the doldrums.

Cold-finished bar market is quiet, with tonnage available for early delivery. Alloy bars continue dull. Some producers are anticipating a demand pickup in August, chiefly from the auto parts makers, due to inventory depletion along with some protective buying against a possible steel strike in September. Some alloy bar sellers are confident August business will show a decided improvement over that of July.

New York—Increase in hot carbon bar demand reflects resumption of operations at many plants which had been closed for vacations. In some instances, consumer inventories have dropped lower than is desirable and, with less likelihood of any immediate change in prices, the whole picture is more encouraging to sellers. However, new bookings have not extended delivery schedules materially. In fact, there is plenty of tonnage in practically all sizes available for delivery in August. Cold-drawn carbon bar deliveries continue easy, especially now that sellers have replenished their stocks to the most satisfactory basis in the postwar period. Only in some special sizes is there much difficulty in making early delivery. Hot and cold-rolled alloy deliveries are easy, ranging around two to three weeks in most cases.

Boston—Carbon and alloy bar inventories are still substantial for current reduced operations, as is indicated by lack of buying. There are openings in August schedules with likelihood considerable capacity will be down at least part of this month. This is especially true of cold-finishing equipment. With hardly an exception, and including warehouses, major users of bar stock are drawing on inventory for bulk of lower requirements. Forge, bolt and nut shops are on reduced schedules.

Philadelphia—Hot carbon bar consumers report little difficulty in obtaining early shipments within a month on practically all sizes of rounds up to 3 and 3½ in. Shipments on the larger sizes extend perhaps two to three weeks beyond. Cold-drawn carbon bars are available within two to three weeks, sellers having augmented supplies to a point where they can actually make shipment on many items from stock. Hot and cold-rolled alloy bars also can be had promptly.

Chicago—Promptness of delivery is becoming increasingly the determinant as to where bar business will be placed. One mill last week was able to take an order for hot-rolled bars in a particular size for rolling during the second week in August, but third week promise for another size was not satisfactory with an

automotive producer. Most producers' books are well filled for August and some are oversold for that month. Customers are displaying an unusual reluctance to make their September requirements known. Alloy demand shows no change, and automotive and farm implement consumers, particularly the larger units in the latter industry, continue to be the important buyers for both hot and cold bars.

Los Angeles—Although the market is glutted with cold-finished bars, selling in some instances as much as $20 per ton under mill price, demand remains good for alloy bars. Operations of home appliance and farm implement manufacturers are holding up fairly well. State of California has set aside $1 million for the purchase of special farm equipment which will be rented to soil conservation districts.

Wire . . .

Wire Prices, Page 123

New York—While wire buying is still spotty, a better volume of business is coming out. Wire formers are specifying more actively, having worked off inventories to a considerable extent. The bedding industry is specifying more freely and specifications from wool wire makers continue at a high rate.

Manufacturers of plain bright hard-drawn wire are offering deliveries within three to four weeks; five to six weeks where wire is annealed or specially processed. Producers of valve spring and music wire and other specialties request from two to six weeks for shipment, depending upon processing. Very little of this material is being produced from mill inventory. One leading producer of specialties is now operating at around 65 to 70 per cent of capacity.

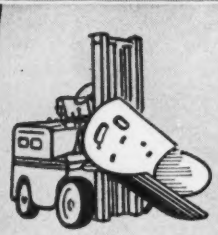
Boston — While some orders for wire products which had been deferred over last two months are being released for August-September shipment, new buying is slow. Screw manufacturers and users of heading wire are holding up some volume while wire formers are buying hand-to-mouth. Larger wire users hold substantial inventories in some instances and are covering only fill-in requirements. Production by wire mills is lower due to vacations; supply of semi-finished, including rods, is ample.

Tin Plate . . .

Tin Plate Prices, Page 123

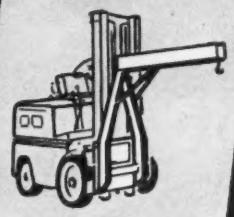
Pittsburgh—Shipments of tin plate are a little less active than a week or two back, but this is considered a normal development in view of the heavy tonnages taken prior to July 16 when threat of a steel strike stimulated ordering by consumers as a protective measure. September is expected to prove a fair month for specifications, though seasonally off from August. This view is largely conjecture, since tin plate users may decide to get in a large tonnage as protection against a possible steel shutdown. For the most part, the tin plate market lacks the pressure that was evident in recent past years.

MATERIAL HANDLING News®



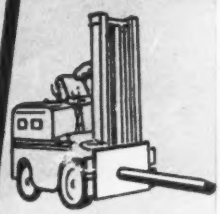
Paper Scoop

Picks up roll of paper from horizontal or vertical position and deposits it either way.



CRANE

for handling many large, unwieldy items unsuitable for forks or pallets.

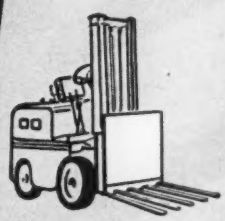


RAM

for handling coils or spools of material, castings and many fabricated units.

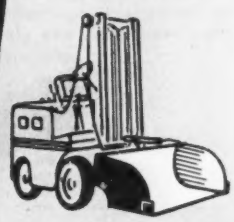
Clamp Lift

for handling boxes or other units that can be gripped securely between the clamping arms.



Brick Fork

for lifting and carrying bricks, concrete blocks and similar products assembled in special patterned units.



SHOVEL

for easy pick-up and dumping of sand, cinders, gravel, coal, aggregate and other bulk material.

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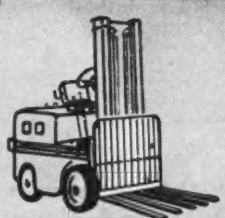
Inherently versatile, the Clark fork-lift truck, through special attachments to meet specific handling needs, attains far broader usefulness for performing basic materials-handling operations. These attachments, easily and quickly interchangeable with the standard forks, equip the machine to handle items varying widely in size, shape and weight—and often without employing conventional pallets. Benefits immediately realized include faster movement of material, increased storage area, greatly reduced accident rates and elimination of some operations.

YOUR Clark dealer is a man worth knowing—competent to appraise your opportunities for savings, equipped to make unbiased recommendations on how to realize them. It's a sound idea to CONSULT CLARK

Rotating Forks

useful for handling and dumping containers of scrap and other materials.



PUSHER

a most useful device for pushing loads of certain types from the forks.

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REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

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From the same amount of stainless steel required to produce *one* solid sheet of any given gauge, we make *five* sheets of IngAclad.

We bond finest stainless to carbon steel in the proportion of one to four. This gives you easily fabricated sheets of IngAclad, at about half the cost of the solid metal, for use in installations where stainless protection is needed only on the contact side. Your budget for "stainless" goes farther. Why pay for more "stainless steel" than you need?

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STAINLESS-CLAD STEEL

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Plates . . .

Plate Prices, Page 123

New York—Fabricated tank prices are becoming increasingly competitive, with quotations substantially easier than a few months ago. This is due to reductions in plate prices at a number of the smaller independent mills and to a sharpening of estimates on fabricating operations. Contributing to this situation is the fact that various metalworking shops, which over recent years have been specializing in certain work, are now entering the field for a broader assortment of business and are cutting competition in order to get it.

Actually new work is now well short of capacity. There are less oil storage demands at the moment and water tank requirements are off. This is particularly true in public work in New York state where allotments have been underestimated, with various projects either delayed or suspended indefinitely. Private work also is on the slow side. Some leading tank makers have reduced backlogs to the equivalent of four to six months output, depending upon the nature of the work, as compared with twice that amount earlier in the year.

Railroad equipment and ship demand is spotty, resulting in a lag in plate requirements for those purposes. Most plate mills can offer substantial shipment for August delivery.

Philadelphia—While one leading plate producer in the East is booked solidly into late September on sheared plates, most sellers can ship tonnage within a month. In general, business continues spotty, with ingot operations at district mills averaging possibly 75 per cent and even lower where the plants are devoted almost solely to the production of plates. Rolling operations at certain mills are not averaging more than three days a week. Lack of railroad equipment requirements is perhaps the largest single factor in the present lull.

Birmingham — Current vacation period at the plate mill has not affected shipments, since stocks had been accumulated. Demand for plates is steady and on about the basis as for the past few months.

Dallas—Plate market has become highly competitive in this section. Reduction in oil field demand has been keenly felt, though it still is the source of the biggest segment of business for the shops. This oil country volume includes the refinery and gasoline plant business, which is steadily converting to more highly refined processes to offset the reduced demand for fuel oils.

Ferroalloys . . .

Ferroalloy Prices, Page 125

Buffalo—Production of ferroalloys will be suspended at the Vanadium Corporation of America's Niagara Falls plant during August. The plant shutdown, attributed to business conditions, affects approximately 700 workers. Equipment will be repaired during the shutdown.

Tubular Goods . . .

Tubular Goods Prices, Page 123

Pittsburgh—Standard pipe is available on delivery schedules ranging from 30 to 50 days, which is considered normal. Oil well casing and oil well tubing are in less pressing demand than some time ago, but with producers booked up through 1949 volume this year is expected to fall only slightly below that of last year. Number of new line pipe projects have come out lately and have served to buoy hopes of continued heavy demand for a long time to come. In this connection, plans of National Tube Co. to install electric welded steel pipe facilities at McKeesport, Pa., are significant. The new facilities will enable National Tube to compete in a wider market.

Boston—Demand for seamless steel pipe is holding better than that for butt weld; some of the latter tonnage is lacking a market. Larger distributors are well stocked and, since withdrawal of consigned stocks, buying policies are generally more conservative. Average lead time for steel pipe at the mill level now ranges from 15 to 20 days compared with 45 days earlier this year. Pressure tubing has eased considerably; deliveries have improved and allocations have dropped.

Birmingham—National Cast Iron Pipe Division, James B. Clow & Sons, has resumed normal operations after a close-down for new construction.

Dallas—Despite a record breaking building and construction program in Texas supplies of pipe of all dimensions are in ample supply at the moment. Heaviest demand is for the smaller diameter home-construction pipe for equipping dwellings that comprise nearly half of a building program that has outstripped last years' pace. Demand for oil field goods is low because of the curtailed drilling program. Stepped up demand for larger sizes has resulted from the conversion of numerous refineries for the closer refining of crudes necessitated by the reduced demand for ordinary crude for fuel oil usage.

Los Angeles — Demand for very small and very large diameter pipe remains keen, although that for medium sizes has eased considerably. Buying of pipe and equipment by oil producers is well sustained, being concentrated on maintenance and modernization of plant in some instances, and expansion of facilities in others. Gasoline consumption continues to increase in California, with the first five months of 1949 showing a 5 per cent gain over last year.

San Francisco—Small pipes are not moving too briskly, but demand from the oil industry for line pipe and material for refinery expansions is a major factor in bolstering volume of larger sizes. Oil drilling activity this year is running only slightly under that of last year in California; in parts of the Rocky Mountain area, the search for new oil fields is expanding steadily.

Seattle—Little interest is shown in cast iron pipe goods, no important projects being up for bidding. The largest job pending totals 300 tons of 4 and 6 in. water pipe for Kirkland, Wash.

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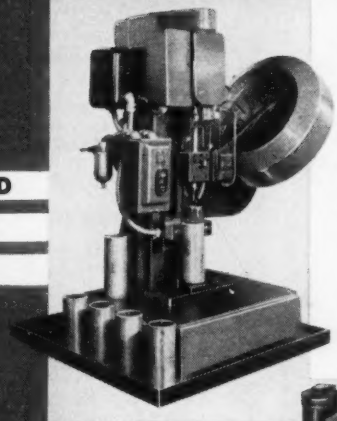
MOTORIZED HOPPER UNITS



Motorized Hopper Units by the Detroit Power Screwdriver Company are "tailor-made" for special assembling applications . . . They eliminate the manual handling of parts . . . Let us solve your production assembling problem . . . Contact us now; send special assembly and component parts for quotation.

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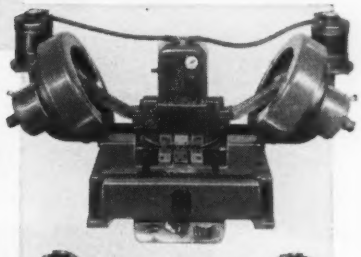
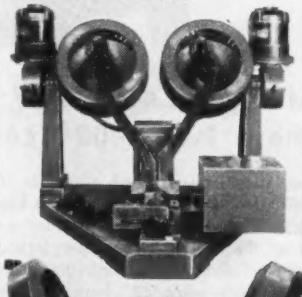
Pressing terminal studs in dry cell batteries.

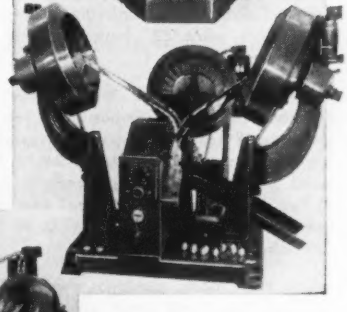
MAGAZINE FEED POWER SCREWDRIVERS



Assembling small hardware hinges by inserting two hinge pins simultaneously.

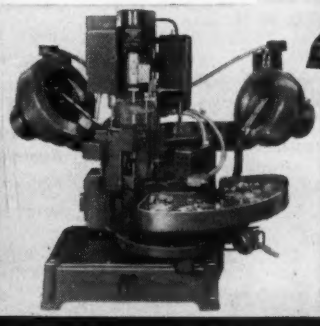


Inserting mounting screws in cooking utensil handles.



Automatic assembly of toy plastic wheels and axles.

MAGAZINE FEED NUT DRIVERS



Assembling screw and fibre washer to cable clamp for electrical outlet box for shipping purposes.

DETROIT POWER SCREWDRIVER CO.

2811 W. FORT ST. • DETROIT 16, MICH.

Structural Shapes . . .

Structural Shape Prices, Page 123

New York—Structural inquiry is slightly improved, due in part to lower fabricated material prices and to increasing doubt in some quarters that plain material prices will undergo any broad change in the near future. Several weeks ago consensus among steel buyers was that a drop in prices by the leading producers before fall was likely; this opinion has been modified by the turn in labor negotiations.

Boston — Few outstanding structural projects are up for estimates. Stone & Webster Engineering Corp., Boston, has received bids for a 1500-ton power plant extension at Somerset, Mass. Awards include 1250 tons for an engine shop at the Naval air base, Quonset Point, R. I., to Bethlehem Steel Co. Bridges being estimated are chiefly small spans, requiring little shop work. Seven-weeks strike by iron workers, now settled, has delayed deliveries from district shops, and fabricated steel in many cases will not be on the job on the date promised.

Philadelphia—Slightly better volume of structural inquiry is noted, although still predominately of public and semi-public character. Most projects are relatively small. Fabricators are still reducing backlogs.

Dallas—With supplies ample, competition for sales of all types of structurals has been growing keener. Though construction has shown no lag, the increasing availability of materials has spurred the return of close bidding for the jobs. Construction is at a postwar peak and would be greater were business conditions more settled. Many building projects which have been held up pending better prices are expected to get under way to swell the volume in this section beginning this fall.

Los Angeles—Dearth of large steel construction projects, combined with heavy inventories, has severely affected demand for structurals. One mill, originally suspending for a 30-day period, has extended its shutdown. Only items moving in any volume are wide-angle beams and bar-sized shapes.

Structural Bookings Decline

New York—Fabricated structural steel bookings totaled 697,091 tons during the first six months of the year, a decline of 27.5 per cent from the total for the like 1948 period, American Institute of Steel Construction, this city, reports. They were slightly greater than the average for the same period in 1936-1940.

Estimated bookings for June totaled 93,053 tons compared with revised totals of 116,975 tons for May and 98,802 for April.

June shipments amounted to 163,549 tons, making the total for the first half 998,366 tons, or 3.3 per cent higher than those for the like 1948 period and 48.3 per cent greater than for the averaged period of the five prewar years.

The tonnage available for future fabrication within the next four months only amounted to 583,289 tons at the end of June compared with 647,474 tons a year ago and an average of 347,930 tons on the same date during 1936-1940.

Stainless Steel . . .

Stainless Steel Prices, Page 123

Pittsburgh — Sellers of stainless steel products are actively seeking new business, but orders are developing slowly. The slump in demand has forced sharp curtailment of production here over the past several months and the immediate outlook for a pickup is not promising. However, once consumer inventories have been reduced to the point their stock position is corrected, a sizable buying spurt may be experienced. Heavier demand may develop from the redesign of consumer and certain industrial products, a substantial increase in requests for design and engineering information evidencing a growing interest in stainless. The market for stainless is expected to broaden appreciably, as more and more consumers turn to its use in producing items with eye-appeal and practicality for the general consumer. This trend is certain to accelerate as competitive conditions intensify. At the moment, however, demand for stainless is spotty.

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MARVEL BAND SAW saved these two 4400# castings

Two sand cores washed out when these giant 4400 pound steel connecting rods were cast, resulting in solid eye ends without gaps. Then came the $64 question—how to machine out the 1½" slots in the longitudinal center of the eyes which were 22" high and had a wall thickness of 6½".

The Ernest J. Nelson Iron Works of San Francisco, did this "impossible" job easily, quickly and economically, without special tooling, on a standard Model #8M/2 MARVEL Band Saw. Two cuts were made in each rod in two hours per cut with tool cost of $3.06 per rod. The tool was a MARVEL B9-10 Band Saw Blade.

Every tool room, machine shop and maintenance department needs a MARVEL Series 8 Universal Band Saw—not only for innumerable everyday jobs but for the occasional "trick" operations, where its utmost versatility will save many headaches and dollars.

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3. Power-pressure feed.
4. Automatic Blade tension.
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MARVEL Metal Cutting SAWS
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5700 BLOOMINGDALE AVE. CHICAGO 39, ILLINOIS

Warehouse . . .

Warehouse Prices, Page 125

New York—Jobbers anticipate a mild improvement in business in August, but no substantial increase before fall. July was the slowest month so far this year.

Philadelphia—Jobbers look for August business to show a slight gain over July. They anticipate fewer suspensions for vacations and perhaps some relief from the torrid weather conditions which have prevailed throughout July which was the slowest month so far this year for local jobbers. Distributors' stocks are in the best shape since before the war. Some, however, are still in the process of working off odd sizes and specifications which they acquired during the stringency for substitution purposes. Reflecting advances in zinc, No. 10 galvanized sheets are now holding at 6.78c, city, and 6.63c country.

Cincinnati—Volume of warehouse sales during July was on a par with business in June. A better supply of structural steel to meet district demands may help to sustain August volume against any seasonal dips in other items. Ordering for fill-in stock discloses some fabricators still hold above-normal inventories. Exhaustion of this overhang may bring an upturn in jobber deliveries within a few weeks. Galvanized and cold-rolled sheets are scarce.

Chicago—Warehouse steel demand increased sharply last week. While stocks are better balanced, certain items move out as fast as received. Contributing to the better supply situation is the resumption of shipments to warehouses by one district mill after a lengthy period in which no steel was shipped to these outlets. Oversupply is particularly noticeable in certain sizes of bars. Secondary products demand continues limited with most mills finding it extremely difficult to dispose of wasters to this trade. Galvanized products remain in short supply, although warehousemen are now cautious in moving up prices in reflection of increased zinc costs.

Los Angeles—With July off to a slow start, deliveries by jobbers are increasing steadily. Virtually all warehouses are over-stocked in some categories, and principal effort now is to balance inventories. Considerable surplus is being offered at shaded prices, but good items seem to be readily absorbed.

Seattle — Wholesalers' July business volume has been disappointing. The decline in bookings from those in June is attributed in some measure to the decrease in operations in the pulp, plywood and sawmill industries which are normally heavy buyers.

Penn-Ohio Steel Closes Plant

Birdsboro, Pa. — Penn-Ohio Steel Co., this city, has ceased production. The company about a year ago leased a government-owned plant here for the production of ingots for sale for conversion during the steel stringency. It produced up to 7500 tons of ingots per month.

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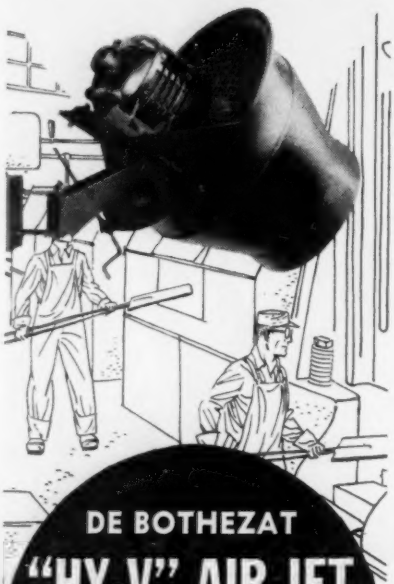

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Pig Iron . . .

Pig Iron Prices, Page 124

Pittsburgh—Although activity in merchant iron is restricted, some sellers sense a slight improvement in buyer sentiment. Spotty buying is reported. On the whole, sellers anticipate no marked spurt in demand pending clarification of the general business outlook. Uncertainty with respect to labor developments is a factor holding back some tonnage.

Certain consumers, especially those of basic, are holding substantial iron inventories. A few district foundries have liquidated inventories to the point a pickup in castings demand would find them short of iron and would force them to scramble for tonnage. Production schedules at foundries are restricted now by vacation shutdowns. A slight pickup in foundry iron buying may develop in August, but it may be limited by the fact that some castings producers augmented their inventories in anticipation of a steel strike.

Basic iron consumers are showing no interest in metal. At least two in this district have been operating their openhearth departments on a sharply curtailed basis for some time. In both instances they are holding substantial inventories of iron and, consequently, are not likely to reenter the market as active buyers in the immediate future.

Boston—Shipments this month will be slightly heavier with scattered releases from smaller foundries appearing. Except by two or three consumers, foreign iron is now liquidated. Inventories held by most shops are not large and any improvement in demand for castings would soon be reflected in buying. However, no substantial improvement is indicated. Steelworks consumption of iron last month was lowest in recent years, excepting strikes. Mystic Iron Works, Everett, Mass., continues in blast, although piling iron, and may go through August.

Philadelphia—Pig iron melt may show a little improvement this month. While July as a whole was the poorest so far this year, there was a little pickup in the latter part of the month as widespread vacations in foundries ended and as casting inquiry gained slightly. Foundries generally have reduced their casting prices substantially, as compared with the early part of the year, resulting in a modest pickup in business. Many buyers of castings, as well as foundries are still looking for lower prices in pig iron.

Buffalo — Foundry activities remain extremely slow with no immediate prospects of a general improvement. Disclosure that American Radiator & Standard Sanitary Corp.'s Bond plant warehouses were crammed with 50 million pounds of boiler products seemed to eliminate that leading melter as an operating factor for some time. The Bond plant was closed indefinitely July 1.

District pig iron production increased by the blowing in of the sixth blast furnace at the Lackawanna plant of Bethlehem Steel Co. The furnace had been down since early June for relining.

While pig iron prices continue

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steady, some cracks are noticeable in the structure of oven foundry coke prices. Partial absorption of freight is being made to meet increased competition for limited business. One of the leading local interests reduced its delivered price to Buffalo foundries 5 cents to $22.90 a ton.

Sharon, Pa.—Sharon Steel Corp. has blown in its blast furnace at Lowellville Works, Lowellville, O., and one furnace at Farrell Works, Farrell, Pa. The company had been using cold metal in its steelmaking furnaces.

Cincinnati—Furnace interests foresee no imminent expansion in pig iron demand as the market continues extremely dull. However, they are expecting some improvement in September on a pickup in seasonal castings needs, and because of the exhaustion of melters' inventories.

Chicago—Unexpectedly good demand for merchant iron is reported by some sellers, July shipments exceeding those for June. Outlook for August is for further improvement. The previously low state of inventories is a major factor in the upturn. Threat of strike in mid-month also stimulated demand. Not all casters have brought their inventories down to more desirable levels and, with the labor dispute still unresolved, some shops likely will continue to keep their stocks larger than present operating levels warrant. A number of job shops working on household appliance accounts report a better volume of new business. Improved demand for some castings has immediately been reflected in greater iron demand; a 25 per cent increase in castings output, for example, requires 50 per cent more iron, one half of the increase to take care of the greater production and the other half to bring iron inventory up to a more realistic level.

Despite recent demand upturn in some quarters, lack of demand caused Interlake Iron Corp. to blow out its "A" furnace at its Federal plant here. Inland Steel Co., with seven out of eight furnaces currently on blast, recently switched one from spiegeleisen to malleable iron. In the district, 37 out of 43 furnaces are in operation.

Birmingham—Total pig iron output is lower on removal of Tennessee company's No. 4 furnace at Ensley for repairs. Merchant iron output is sustained, except for one Republic stack which is being repaired. Demand for merchant iron has improved gradually since May.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 124

Chicago—Effects of the three-day work-week in the coal mines are beginning to be felt here. The mining curtailment is making inroads on integrated steel producers' stockpiles and it may force foundry coke interests into the open market soon for coking coal. The miners' "spread-the-work" policy is resulting in production of an insufficient amount of coal by captive mines and the supply must be augmented soon with the product from commercial mines. This situation will adversely affect both the quality and price of coke.

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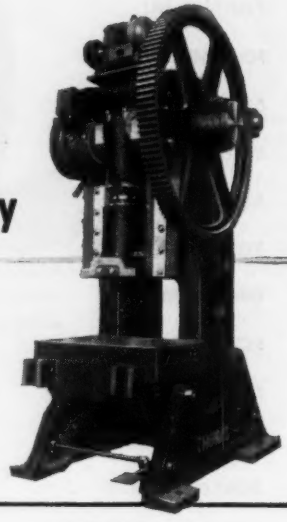

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P-5 **PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES**

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Scrap . . .

Prices hold fairly steady in sluggish markets. Collections continue light

Scrap Prices, Page 128

Pittsburgh — Substantial purchase of No. 1 heavy melting steel at $21 was made by a district steel producer last week, substantiating the preceding week's quotation. The purchase was distributed among some 15 sellers and covering on the tonnage tended to force broker bids higher.

Generally speaking, steel mills are showing little interest in scrap though steelmaking operations were higher last week and may go still higher this week. However, mill scrap inventories continue large and the present speedup in steel operations is attributed to producers' efforts to get out as much tonnage as possible to consumers before a possible strike in September.

Foundry buying of scrap continues sluggish. Dealers and brokers are pressing for foundry business, but their efforts are meeting with little success. A sale of No. 1 machinery cast at $28 was reported last week, but tonnage still is moving at $27. No. 1 cupola cast is quoted $22-$23.

The scrap market is beginning to show a little more life with most buyers and sellers holding the view that the bottom has about been reached, barring a steelworks interruption in September. No definite turn in the price trend is discernible. However, one large mill here has been unsuccessful so far in its attempt to purchase No. 1 heavy melting at $20.

New York— A decidedly stronger undertone is noted in cast scrap, with brokers now offering $20-$21, fob shipping point, on No. 1 cupola cast and $21-$22 on No. 1 machinery. These higher prices are resulting chiefly from efforts on the part of brokers to cover on old contracts.

Steel mill scrap buying prices have advanced $2 a ton, due in part to some new mill buying and to efforts to get covered on back contracts.

Luria Bros. & Co. were high on 1000 tons of rail scrap offered by the New York Board of Transportation. The price was $17.12, for material on the ground ($1.46 higher than the price offered by the next highest bidder). This price represents an increase of about $4 per ton over a month ago.

Boston — In absence of buying, scrap prices are weak and for most part unchanged. Collections are smaller and yard activity is slow. District steel plants are down on sharply reduced schedules and are not buying, the same holding for foundries.

Philadelphia—Tending to support opinions of some trade leaders that scrap prices have reached bottom on the present movement, there have been some slight adjustments upward, based more on sentiment than on actual trading. No. 1 heavy melting steel and No. 1 busheling and No. 1 bundles are holding at $17.50, delivered; No. 2 heavy melting steel, $16.50; No. 2 bundles, $15.-$15.50. Machine shop turnings and mixed borings and turnings are nominally

higher at $11.50-$12. Electric furnace bundles are $18.50; heavy turnings, $17.50. No. 1 chemical borings are $16-$17, based on light trading.

An increasingly strong undertone prevails in cast scrap, with No. 1 cupola cast at $25, delivered; No. 1 wheels, $27-$28.

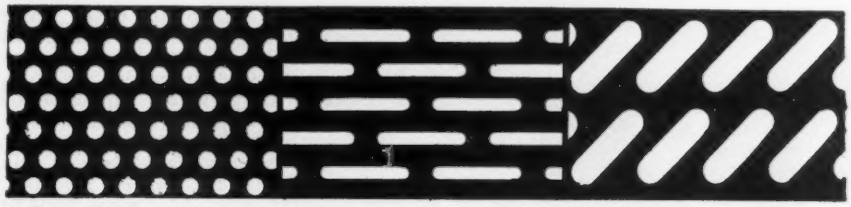
Buffalo—Scrap advanced here last week, steelmaking grades changing hands at $1 to $2 higher while cast was bringing $2 to $4 higher. Tonnage sold was still limited, but the downward trend has been reversed, at least temporarily. About 3000 tons of steelmaking scrap were sold to a leading mill on the basis of $20-$20.50 for No. 1 heavy melting while No. 2 material was placed at $17-$17.50, gains of $1. Short shoveling turnings were moving at $15-$16, an increase of $1.50 to $2.

No. 1 cupola cast sold at $25-$26, an increase of $3. Mixed yard material was quoted at $24-$25, a gain of $4.

Cincinnati—Undertone of the scrap market is firmer, partly on higher quotations for drop broken cast, malleable, and short rails. Some foundry inquiries for tonnage are current, but buying of open-hearth material is absent from this market. Brokers and dealers who contend that the bottom of the price slide has been reached point to the halt in collections which were discouraged by current prices, higher labor costs and higher freight rates.

Detroit—Closing of large automotive lists last week brought a flurry of buying by brokers which pushed the market up momentarily by as much as $1 to $1.50 per ton. It was believed to represent covering on short sales made quietly over recent weeks, inasmuch as steel mills are not interested in buying within $2 of the presently quoted market. For this reason, no changes are being made in the list as yet, pending clarification of the true market conditions. However, sentiment definitely is stronger in view of firming prices of cast iron scrap and the upward trend developing in nonferrous metals. High level automotive output is going even higher and shows no signs of weakening, thus insuring a steady flow of production steel scrap over the next few months.

Chicago—While scrap prices held unchanged last week with no new mill purchases reported, the market was seething underneath. Brokers found it virtually impossible to cover the few outstanding orders at the old prices, and some dealers and scrap generating companies were not willing to sell their scrap at any price. One district mill intends to hold the price for industrial scrap firm at the July level throughout August, but has not made so far any purchase of allocated material for August delivery. Most brokers plan to stay out of the market at this time and await developments. Explanations of the present situation, are found in the improved ingot rate, expectation that steel demand will improve further over the next few months, and the general business tone which has improved. Bulk of demand for cast grades is coming from out-of-district foundries. Brokers' buying prices on several items now correspond with consumers' buying prices and "short" sellers are attempting to buy not



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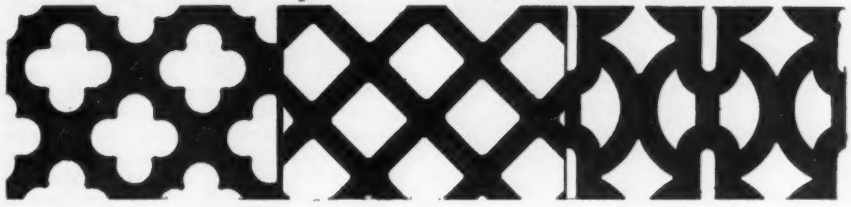

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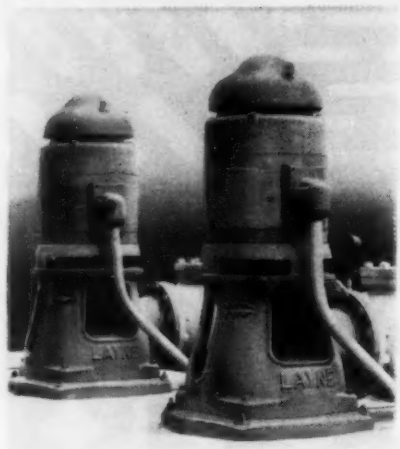

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only enough scrap to cover their orders in hand but also an equal amount to recoup their losses in case the mill-imposed price lid is split.

Dallas — Only small amounts of scrap are moving in Texas, but dealers feel that shipments will improve soon. The heaviest purchaser in this section, Sheffield Steel at Houston, has not placed an order since July 10 when $15 a ton, shipping point basis, was paid. No metal is moving to outside areas because of the freight setup.

Los Angeles—Although mill stockpiles of scrap still bulk large and purchases have not increased, a little more optimism is evident among dealers. Principal reason is the hope of an upturn in mill operating rates, with a consequent increase in scrap requirements. Meanwhile, receipts of material at dealers' yards are off substantially. With 50 to 75 per cent of the former peddlers out of business, industrial sources are providing most of the domestic scrap. Increasing attention is devoted to quality, with mill buyers seeking higher yield material in order to lower unit costs.

San Francisco—Activity in scrap yards continues slow. Mills are buying little, and then only with great selectiveness. A let-up in shipments from Pacific areas hasn't brought renewed life to domestic yards.

Seattle — Mills are drawing on scrap inventory to reduce stocks. Supplies are satisfactory at the current level of $17 for No. 1 and No. 2 heavy melting. Bethlehem Pacific Coast Steel Corp. has received at its local mill another full cargo of 9000 tons from Japan, including considerable alloy material, billets and ingots. No further arrivals from Japan are scheduled.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1590 tons, state turnpike section 28-B-2, Montgomery county, Pennsylvania, to American Bridge Co., Pittsburgh.

1250 tons, engine repair shop, naval air station, Quonset Point, R. I., to Bethlehem Steel Co., Bethlehem, Pa.; Ayers-Hagen Co., Providence, R. I., general contractor.

960 tons, general hospital, Lancaster, Pa., to Lehigh Structural Steel Co., Allentown, Pa.

600 tons, including machinery, single leaf bascule bridge with three truss spans, Merrimack river, Haverhill-Groveland, Mass., to American Bridge Co., Pittsburgh; T. Stuart Co., Watertown, Mass., general contractor.

410 tons, new junior-senior high school, Williamsville, N. Y., to Buffalo Structural Steel Corp., Buffalo; John W. Cowper Co., Buffalo, contractor.

275 tons, state turnpike section 28-B-1, Chester county, Pennsylvania, to American Bridge Co., Pittsburgh.

230 tons, state turnpike section 27-B, Chester county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

215 tons, St. Josephs building, House of the Good Shepherd, Philadelphia, to Robinson Steel Co., that city.

160 tons, addition, Columbia Malleable Casting Co., Columbia, Pa., to Goetz Welding Co., Harrisburg, Pa.

130 tons, new junior-senior high school, Williamsville, N. Y., to Buffalo Steel Co., Tonawanda, N. Y.

110 tons, 6-story apartment, Greenwich street, New York, to Grand Iron Works Inc., that city.

100 tons, addition to Columbia Brewery Co.'s plant, Tacoma, Wash., to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

1930 tons, substructure and superstructure, Island-Seaside Heights bridge, Ocean county, New Jersey, bids closed by the New Jersey state highway department, Trenton, N. J., Aug. 11; 459 tons of reinforcing steel also required.

1513 tons, three sections, state road work, Cumberland county, Pennsylvania; bids Aug. 10; sections will require 805 tons, 430 tons and 278 tons, respectively.

1500 tons, manufacturing building, Carrier Corp., Dewitt, N. Y., award expected momentarily; Lockwood, Green & Co., New York, engineers.

1500 tons, power plant extension, Montaup Electric Co., Somerset, Mass.; bids in to Stone & Webster Engineering Corp., Boston.

350 tons, State Teacher's College, Pottsdam, N. Y.; bids Aug. 1.

350 tons, building, American Sugar Refining Co., Greenpoint, Long Island; pending.

290 tons, section, state road work, Cumberland county, Pennsylvania; bids Aug. 17.

175 tons, Washington state bridge, Island-Snohomish counties; Manson Construction & Engineering Co., Seattle, low, $348,178.

150 tons, addition to Crescent store, Spokane, Wash.; Henry George & Sons, Spokane, general contractor.

100 tons, post office garage and maintenance building, Bridgeport, Conn.; bids closed July 28; Fletcher-Thompson, that city, engineer.

REINFORCING BARS . . .

REINFORCING BARS PLACED

150 tons, road projects, schools, general construction, to Bethlehem Pacific Coast Steel Corp., Seattle.

135 tons, utility tunnel, University of Washington, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Rumsey & Co., Seattle, general contractors.

REINFORCING BARS PENDING

135 tons, Washington state bridge, Island-Snohomish counties; Manson Construction & Engineering Co., Seattle, low, $348,178.

135 tons, four Washington state highway bridges, Grant county; N. F. Lampson, Spokane, low, $135,481.

110 tons, Washington state girder bridge, Okanogan county; Roy L. Bair, Spokane, low, $162,234.

Unstated, completion of Medical Lake State Hospital; bids to H. D. Van Eaton, Washington state director, Olympia, Wash., Aug. 16.

Unstated, fish processing plant for Lyle Branchflower Co., Seattle; Howard S. Wright Co., Seattle, low base bid $115,600.

Unstated, six-story Queen Vista apartment building, Seattle; Stuart & Durham, Seattle, architects; general contract to Hebb & Narodick Construction Co., Seattle.

PIPE . . .

CAST IRON PIPE PENDING

300 tons (if cast iron), 6 and 8 in. water pipe, Kirkland, Wash.; bids, including alternatives, in July 25.

190 tons, 4, 6 and 8 in. water supply pipe, also well drilling and equipment; bids to Tumwater, Wash., Aug. 3; Carey, Kramer and Associates, Seattle, engineers.

100 tons, 6 in. cast iron pipe and fittings; bids to Kent, Wash., Aug. 1; Charles Bridges, city clerk.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Canadian National, three 1300 hp electric passenger locomotives, to Canadian General Electric Co., Toronto.

RAILROAD CARS PLACED

Seaboard Air Line, 25 cabooses, to International Railway Car & Equipment Mfg. Co.

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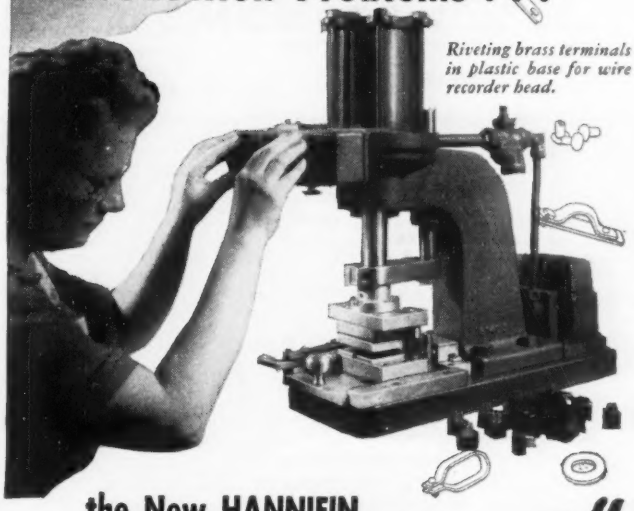

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CONSTRUCTION AND ENTERPRISE

CALIFORNIA

BREA, CALIF.—Union Oil Co. plans to construct a $5 million research center consisting of 12 buildings.

CONNECTICUT

NEW LONDON, CONN.—New London Mills Inc., 33 Pequot Ave., has asked bids on a $450,000 plant, Pequot Ave.; Fletcher Thompson Inc., 211 State St., architect.

IDAHO

POCATELLO, IDAHO—Pacific Fruit Express will build a repair shop and clearing trackage; estimated at $1.4 million.

ILLINOIS

CHICAGO—Anheuser-Busch Inc., 2367 Logan Blvd., St. Louis, has awarded a $200,000 contract to Frank Stowell Co., 111 W. Monroe St., for construction of a warehouse; Robert Layer, 189 W. Madison St., architect.

CHICAGO — Chicago, Burlington & Quincy Railroad has asked bids on a $500,000 warehouse; H. R. Clarke, chief engineer, 547 W. Jackson St.

KANSAS

KANSAS CITY, KANS.—Colgate-Palmolive-Peet Co., 105 Hudson St., Jersey City, N. J., has awarded a $1 million contract to S. Patti Construction Co., 1340 Admiral Blvd., for construction of a plant.

WICHITA, KANS.—Kansas Milling Co., 715 E. 13th St., has awarded a $200,000 contract to Chalmers & Borton, Hutchinson, Kans., for construction of a grain elevator.

MICHIGAN

DETROIT—Nash Motors Division, Nash-Kelvinator Corp., plans additions to its plants at Kenosha, Wis., and Milwaukee, involving a building program expenditure of approximately $2 million. The Kenosha plant addition will join the present motor assembly building, 30th avenue, and contract has been awarded to Permanent Construction Co., Milwaukee; approximate cost $600,000. The Milwaukee body plant will be constructed on Holton street, and will cost approximately $1.5 million; Meredith Bros. Inc., general contractor, has the contract.

MISSISSIPPI

CANTON, MISS.—Mississippi Federated Cooperatives, Fertilizer Co., has awarded a $225,000 contract to John J. Harter Co., Techwood Rd. N.W., Atlanta, for a plant addition.

MISSOURI

COLUMBIA, MO.—Norvell Wholesale Grocery Co., Columbia & Wetterus Grocery Co., Mexico, Mo., plans to build a $300,000 warehouse.

NEW YORK

ASTORIA, N. Y.—I. H. Steinhardt, c/o Irving Kudroff, 103 Park Ave., New York, Zone 17, plans to build a $140,000 factory and office, Steinway street, south of 19th avenue.

LONG ISLAND CITY, N. Y.—A. Thypin, 153 Beach 135th St., Belle Harbor, N. Y., will build a $250,000 warehouse; plans by Saul Goldsmith, 80 Livingston St., Brooklyn, N. Y.; site will be 30th street & Hunters Point avenue.

NEW YORK—565 Barry St. Co. will build a $135,000 factory, 566-71 Barry St.; plans by Irving Margon, 12 E. 44th St.

NORTH TONAWANDA, N. Y.—International Paper Co. plans a $250,000 plant.

NORTH CAROLINA

HENDERSONVILLE, N. C.—Kalmia Dairy Plant has awarded a $125,000 contract to Merchant Construction Co., Asheville, N. C., for construction of a plant.

OHIO

CANTON, O.—Canton Metal Alloys Co., which suffered a $40,000 loss by fire to its factory, 1551 Belden Ave. S.E., are planning to rebuild as soon as an insurance adjustment is settled.

CINCINNATI—Wirthlin Man Co., 66 Plum St., plans to build a $150,000 warehouse; plans by W. Carlton & Associates, 15 E. Eighth St.

CLEVELAND—General Chemical Co., Warner road, is planning a $100,000 improvement and installation of new equipment to prevent escape of gas into the air from one of the units used in production of sulphuric acid.

CLEVELAND—Republic Mfg. Co., 1930 W. 77th St., suffered a $35,000 fire loss at its plant. Also damaged by the fire was Cleveland Beacon Product Co. which leased space in the building.

OKLAHOMA

MIAMI, OKLA.—Goodrich Rubber Co. has awarded a $700,000 contract to Jones Bros. Construction Co., 1109 Byers St., Joplin, Mo., for construction of a warehouse.

OKLAHOMA CITY, OKLA.—R. A. Young, president, T. G. & Y. Stores Co., 106 N. Eighth St., has asked bids on a $350,000 warehouse and office; Coston & Frankfurt, Apco Tower, architect.

TENNESSEE

MEMPHIS, TENN.—Dixie Greyhound Bus Lines, c/o contractor, has awarded a $400,000 contract to Tri-State Construction Co., Three Sisters Bldg., for construction of a bus terminal, Union at Hernando.

TEXAS

AGUA DULCE, TEX.—Panhandle Producing & Refining Co., City National Bank Bldg., Houston, will build a $650,000 gas compressor plant; owner builds.

FALFURRIAS, TEX.—La Gloria Corp., Driscoll Bldg., Corpus Christi, Tex., has awarded a $650,000 contract for a gasoline recovery plant; owner builds.

FORT WORTH, TEX.—Community Public Service Co., Electric Bldg., has awarded a $200,000 contract for an electric power plant extension; own forces.

HOUSTON—Hughes Tool Co., 300 Hughes St., was awarded a $90,000 contract for plant extension and improvement; owner builds, Wilson P. Martin, c/o owner, engineer.

HOUSTON—Shell Oil Co., Shell Bldg., has awarded a $1,350,000 contract to Fluor Corp. Ltd., M. Esperson Bldg., for construction of a gasoline plant at Provident City, 75 miles south of Houston.

VERMONT

ALEXANDRIA, VA.—Potomac Electric Power Co. has Federal Power Commission authority to loan $13 million to its subsidiary, Braddock Light & Power Co., for addition to Braddock power plant.

ROANOKE, VA.—Norfolk & Western Railway, A. B. Stone, chief engineer, General Office Bldg., has awarded a $300,000 contract to J. M. Turner, 137 Campbell Ave., for construction of a motive power building annex on Shenandoah avenue near Randolph street bridge.

WASHINGTON

OLYMPIA, WASH.—Scheumann & Johnson, Seattle, low $124,287, have the award for the second unit of Washington state's Deschutes Basin project, involving radial gates, control house, fishway, etc.

SEATTLE—Northern Pacific Railroad and Great Northern Pacific Railroad, Railroad Bldg., St. Paul, has awarded a $350,000 contract to N. W. White Construction Co., Pier 65, for construction of four service buildings in coach yards in King street, passenger station, Third Ave. S., storehouse, car service building, concrete oil house for storage, hard fuel storage house; mechanical work to University Plumbing & Heating Co., 3941 University Way.

SEATTLE — Lyle Branchflower, 15th Ave. N.W. & Shilshole Ave., will let a $160,000 contract for a fish processing plant; S. Ivarsson, Skinner Bldg., engineer.

SEATTLE—Bemis Bag Co., 65 Atlantic St., has awarded a $200,000 contract to Austin Co., 16112 Euclid Ave., Cleveland, for construction of a bag plant addition.

SEATTLE—North Pacific Railroad, B. Blum, engineer, 176 East Fifth St., St. Paul, has awarded a $150,000 general contract to N. W. White, Pier 65, for a store house, covered storage platform, oil house, fuel storage building and car service building.

SEATTLE—California Wire Cloth Co. has awarded contract to MacRae Bros. Co. for construction of a warehouse at 3434 Second Ave. S.

SEATTLE—Utility Construction Co., Tacoma, Wash., is low, $181,250, for construction of switching station and other installations at Seattle's Diablo dam, structural steel involved having previously been reported placed with Isaacson Iron Works.

SEATTLE—Main foundry building of Pacific Stove & Foundry Co. was damaged by $25,000 fire July 18. Equipment was damaged. Rebuilding plans have not been announced.

SPOKANE, WASH. — McGinnis Construction Co. and Henry George & Sons are joint low bidders at $193,713 for construction of city's Parkwater pumping station.

WALLA WALLA, WASH.—Bids for the second of three major phases in construction of McNary dam were opened July 19 by U. S. District Engineer. Atkinson-Ostrander-Jones submitted the joint low figure of $15,780,000 engineer's estimate being $12,700,000, involving the Oregon shore cofferdam, substructure for two main powerhouse units, station service and assembly bays; completion specified May 1, 1951.

WISCONSIN

MILWAUKEE—Bruce Publishing Co., 402 N. Broadway, has awarded a $125,000 contract to Gebhard-Berghammer Co., 5420 W. State St., for construction of a factory; Brust & Brust, 135 W. Wells St., architect.

ALASKA

ANCHORAGE, ALASKA — Brady-Stateside Construction Co., Seattle, has been awarded contract to install city's 7-mile gravity water supply system on low bid of $446,500.

CANADA

EDMONTON, ALTA.—Arctic Ice Co., 70-97th Ave., plans to build a $150,000 plant; plans by Maitland & Aberdeen.

VANCOUVER, B. C.—Woodward Stores Ltd., 101 W. Hastings St., will build a $400,000 warehouse; owner builds.

BRANTFORD, ONT.—Freeborne Co. Ltd., 71 Elgon St., plans to construct a $300,000 factory.

CORNWALL, ONT.—M. M. Dillon & Co., engineer, Bank of Toronto Chambers, London, Ont., has asked bids on a warehouse for Brewers Warehouse Co. Ltd., 19 Richmond St., W. Toronto, Ont.; about $125,000.

PORT BURWELL, ONT.—Pennada Oil Refining Co. Ltd., 118 W. King St., Chatham, Ont., will build a $500,000 oil refinery; engineer, c/o Clunis & Kee, 118 W. King St., Chatham.

MONTREAL, QUE.—Canadian Pacific Railway, J. E. Armstrong, chief engineer, Windsor Station, has awarded a $750,000 contract to Anglin Norcross Quebec Ltd., 892 W. Sherbrooke St., for construction of a power house.

ST. ODILON, QUE.—St. Lawrence Co. Ltd., c/o Marius Lord, architect, plans to build a $700,000 asbestos factory.